Labor-Based Industry Clusters:
Using Occupational Structure to Target Industries in Missouri

ABSTRACT The results of this analysis have identified ten labor-based industry clusters, which are to be used for targeted economic development in Missouri. The target clusters include: arts and media; banking; business and organization services; education; finance and insurance; health care; high technology; information technology; transportation; and wholesale trade and purchasing. Collectively, the ten targeted industry clusters identified in the analysis have a substantial impact on Missouri's economy. In 2000, the targeted clusters generated 1.17 million jobs, which accounted for 43.93% of statewide employment. In turn these jobs generated $43.42 billion in wages, which accounted for 51.78% of statewide wages. The clusters pay an above average wage per job of $37,008, which was 117.86% of the state average wage per job. Over the past decade, wage growth has outpaced employment growth, resulting in higher wages per job. Since 1990, employment has grown by 17.92%, wages by 28.81% and average wages per job by 9.24%.

Principal Investigator:
David J. Peters

TECHNICAL PAPER

P-0802-1
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MISSOURI DEPARTMENT OF ECONOMIC DEVELOPMENT

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I. Introduction

Industry clusters have become a popular concept not only among economists, but also among regional scientists, geographers, business analysts and economic development practitioners. Because of this popularity, they are seen as a panacea to a variety of economic ills. This perception is based on the assumption that regional specialization of interdependent firms and their cooperation with other public and private institutions will create synergies, increase productivity and lead to economic advantages for the region (Harrison 1992; Held 1996). Therefore, the call is for regions and their respective political units to develop policies that create and support industrial clusters.

Definition of what constitutes an industrial cluster is obscure since it encompasses many divergent theoretical and methodological approaches (Best 1990). Theoretically, the concept of industrial clustering is not new, since it draws heavily upon the external economy theorists of the late nineteenth century (Marshall 1890) and the agglomeration theorists of the mid-twentieth century (Perroux 1950). Methodologically, clusters are identified using both qualitative methods that rely on expert opinion and case studies; and quantitative methods that employ inter-industry transaction data and sophisticated statistical techniques. In short, industrial clustering is a multidimensional concept based on different economic perspectives. Clusters are measured using different methodological approaches, and are grounded by a range of economic theories.

Interdependence is the essential element in industry cluster theory. This interdependence is the result of globalization, which has transformed the Fordist economy of the mid-twentieth century to the post-Fordist one of today, what we call the global economy. Bonanno and Constance (1996) and McMichael (1996) provide an excellent overview of globalization. The Fordist paradigm was a post-World War II historical construct that attempted to stabilize world capitalism after the war and during the Cold War. This constructed order viewed development as proceeding in a linear direction towards modernization. The worldwide goal was to have each state reproduce the modernity of the First World, and that in time the Third World would progress to the level of First World modernization, with the United States at the apex. This paradigm was characterized by regulation of the economy by the nation-state, stabilizing wage relations and using state subsidies to promote full employment and increased consumption. It was characterized as a mix of Keynesian/Fordist political economies. This paradigm was extended to the Third World as a model of economic and social development by First World governments and agencies. The development paradigm was unsuccessful, partly due to the debt crisis in the 1980s, and its failure was the cause of the rise of an alternative paradigm termed globalization.

Globalization, or the post-Fordist paradigm, is also a historically specific construct. As the developmental paradigm sought to stabilize capitalism via national economic management, the globalization paradigm seeks to stabilize capitalism via global economic management along the lines of specialization rather than replication. The new decision makers under this paradigm include state managers who embrace liberalization, transnational corporate managers and officials of newly-empowered multilateral institutions such as the IMF, World Bank and WTO. Subject to global economic criteria enforced by multilateral institutions, global banks and trade agreements, nation-states find themselves under pressure to maintain credit-worthiness and competitiveness. This necessitates that the state develop programs that nurture industries that are globally competitive.

Therefore, it is essential that development agencies identify and promote clusters of competitive industries within their jurisdictions. Although there are a plethora of methods to define competitive clusters, the main objective of this analysis is to identify industries in Missouri that group together based on their occupational requirements, what is termed labor-based industry clusters. Defining industry clusters based on occupational or labor requirements was done for several reasons. First, labor is an important factor in the profitability and competitiveness of an industry, as important as intermediate suppliers or financial capital. Lack of appropriately skilled labor will constrain the development of an industry. Second, labor is most often geographically bound, meaning that it needs to be acquired locally. Unlike financing, information or physical capital, labor cannot be easily transmitted or shipped from anywhere across the globe. Third, occupational supply is generally amenable to government policy. Investment in and development of public secondary and higher education institutions, as well as job training programs, are policies governments can adopt that will generally affect occupational supply in their jurisdictions.

This analysis uses a cluster-specific policy approach to target state resources to identified industry clusters. This means that clusters are identified in order to direct state resources and programs towards specific industry clusters in Missouri. Identifying these labor-based industry clusters will assist state policy makers in targeting programs to assist particular industry clusters that exist within Missouri. By targeting education and training programs towards specific occupations, policy makers can strengthen these industry clusters by increasing the availability and skill of needed labor components. Concurrently, this analysis will also reduce some of the ambiguity cited in the industrial cluster literature by providing an overview of industrial cluster theory and a quantitative method for identifying clusters.

II. Theories of Industry Clusters

Given the varied theoretical perspectives regarding industry clusters, it is important to delineate the characteristics of clusters that are agreed upon in the literature. Steiner (1998) asserts that that there are three key features common to all theories of industry clusters. First, clusters are based on specialization that results from a high division of labor within the economy. This naturally leads to a high degree of interdependence among economic actors, which leads to increased cooperation. This cooperation can take the form of inter-industry transactions between firms, knowledge exchanges between individuals and institutions or linkages between public and semi-public institutions (Best 1990). These linkages can be based on either formal contracts or social, cultural and political ties. Second, specialization and interdependence is partly based on proximity in both economic and social space (Martin and Sunley 1996). Proximity in economic space entails firms producing similar goods or services. Proximity in social space entails firms sharing similar cultural, political and normative traits. Third, this combination of specialization and proximity results in synergies that increases the competitiveness of the region, which results in higher productivity, economic stabilization and wealth creation for both the firm and region.

Most cluster theories are also based on several key domain assumptions that challenge neo-classical economic theory. First, cluster theories assume that a region's competitiveness is more dependent on the existence of industry clusters than on traditional factors such as cheap land and labor, high government subsidies and technology infrastructure. Second, cluster theories assumes that cooperative competition, where groups of similar firms cooperate to compete against other groups of cooperating firms, is more advantageous than individualistic competition among firms. Third, cluster theories assume that competitiveness cannot be explained merely in linear monocasual terms, but can only be explained and understood by multidimensional factors.

Perhaps one of the most well known theorists of industry clusters is Michael Porter (1990). Using success in international markets as an indicator of national competitiveness, Porter delineated four factors that affected firm competitiveness. First, firm competitiveness was affected by attitudes towards competition, the degree of local competition, attitudes towards market institutions and other socio-historical factors. Second, firm competitiveness was affected by the basic resource endowments available where firms are located, such as access to natural resources, unskilled or skilled labor and technology. Third, firm competitiveness was affected by the nature of local and extra-local demand for domestic and foreign goods for industry or household consumption. Fourth, firm competitiveness was affected by the presence of related and supporting industries, characterized by competition among intermediate suppliers resulting in lower prices.

However, there are several critiques of Porter's work in the field of industry clusters (Jacobs and de Man 1996; Kaufman et al. 1994; Rosenfeld 1996;1997). First, Porter does not elaborate upon the various types of interdependence among firms, with little specification of economic, social and knowledge exchanges. Economic clusters are not just composed of related and supporting industries, but of related and supporting industries that are more competitive by virtue of their relationship. The issue is a problem of measurement. Very little data exists on inter-firm exchanges, save for input-output transaction data. However, this does not capture the richness of exchange between firms. Second, Porter does not deal sufficiently with issues of time and space which foster cluster development. Economic clusters can occur across vast geographic space. The problem then becomes how do regional development agencies foster linkages between the local firm and other member firms in the cluster across the globe. Lastly, Porter does not provide a sufficient explanation of how industry clusters lead to growth and change on a broader level.

So, how do industry clusters relate to policy and economic development? Cluster formation is influenced by the type of policy perspective towards clusters taken by development agencies (Feser 1998a; 1998b). The objective of the cluster-specific policy approach is to encourage the development or emergence of an identified cluster through policy interventions that affect both the supply and demand sides of cluster value-chains. These policy interventions may take the form of traditional economic development programs or through other functions of the state, like education. Therefore, it is not the policy interventions themselves that foster clusters, but the manner in which they are used. The objective of the cluster-informed policy approach is to improve individual economic development interventions by taking into account economic and spatial interdependencies. Therefore, clusters are primarily an analytic tool used to improve the effectiveness of existing economic development programs. The aim is to craft policy interventions that foster cluster development.

Additionally, Feser (1998b) provides a fine discussion of how clusters are used in the policy arena. Cluster are developed and used by various development agencies for resource targeting and resource leveraging. Resource targeting is where clusters are identified in order to funnel resources of the state for strategic planning and investment. Resource leveraging is where clusters are identified in order to develop synergies that create economic growth both within the cluster and the regional economy.

However, cluster policy is often implemented in a variety of ways depending on one's definition of a cluster. In fact, this difference even has a cultural dimension. Sternberg (1991) argues that in the United States industry clusters are used merely as a more sophisticated means

of targeting traditional economic development programs, and are used mainly for marketing purposes. By contrast, in Europe industry clusters help identify and characterize conduits through which learning, innovation, technology, goods and services can be exchanged and diffused. Feser (1998b) outlines a typology of how different definitions of clusters imply different development policies. Policies can be oriented towards: (1) the type of collaborative links among cluster firms, such as intermediate demand, knowledge and technology linkages; (2) the type of firms and actors included in the cluster, such as between firms or between firms and other institutions; (3) the appropriate level of aggregation, such as micro, meso or macro levels; (4) the position of firms in the value-chain; (5) the spatial level of intervention, such as local, regional, national or international; and (6) the specific types of policy interventions employed, such as business assistance, technology transfer, information provision, etc.

Despite all of the advantages imputed to industry clusters, there are some dangers in developing them. First, areas dependent on clusters are more vulnerable to changes in the economy that may result in long-term economic decline or short-term economic instability (Harrison 1992; Tichy 1998). Structural changes in the economy may result in permanent declines in specific economic sectors. If an area has developed a cluster that includes industries going through structural change, this may lead to the economic decline of an entire region. A good example of this is the "rustbelt" in the United States. On the other hand, cyclical changes in the economy may be unevenly distributed across industries. Again, if an area has developed a cluster that includes industries affected by cyclical change, this may lead to short-term economic instability within the region.

A second disadvantage is that clusters naturally benefits some regions over others, where periphery regions – usually rural areas – may be adversely affected by strong growth in core regions – usually urban areas (Jaffe, Trajtenberg and Henderson 1993). This is a conundrum for development agencies in crafting cluster policies. These agencies are often mandated to decrease geographic disparities in employment and income, while cluster policies are likely to succeed best in economically powerful core regions. In essence, cluster policy may concentrate economic prosperity in a few select places. Of course, this is the essence of cluster policies – to use the advantage of a region to beget advantage.

Lastly, cluster policies are prone to failure because they are often poorly conceptualized and developed. This is caused by the fact that clusters are often defined using political justifications rather than economic justifications. When cluster policy is not based on sound economic rationale and rigorous methods, development agencies run the risk of investing scare resources into a few industries that will produce no economic benefit. This point is even more

important when coupled with the opportunity costs of investing those resources in basic infrastructure that benefits all industries.

III. Methodology

Data and Variables

To identify labor-based industry clusters, data on the occupational structure for each industry in Missouri was obtained through the Occupational Employment Statistics (OES) program. The OES program collects data on wage and salary workers in non-farm establishments in order to produce employment and wage estimates for over 700 occupational and over 400 industry classifications. Data from self-employed persons are not collected nor included in the estimates. OES data is classified using two nomenclatures: the Standard Industrial Classification (SIC) and the Standard Occupational Classification (SOC). SICs cover the entire range of economic activities, and classify establishments by the primary type of economic activity in which they are engaged. SOCs cover all occupations in which work is performed for pay or profit, including those of family-owned enterprises. Occupations are classified based on work performed and on required education, training and credentials. In this analysis, 27 occupational groupings were created to reflect the occupational structure of a given industry.

Specialization ratios (SRs), also known as location quotients, are used to describe the dispersion cluster employment across Missouri. In equation (1) SR is the specialization ratio, E is employment, i is the industry, r is the region/county and s is the state. SRs greater than 1.0 indicate that the county is relatively more specialized in an industry relative to the state as a whole; or that the county has a comparative advantage in that industry. SRs less than 1.0 indicate that the county is less specialized in an industry relative to the state as a whole, which may indicate an area for potential growth; or that the county does not have a comparative advantage in that industry. It is important to note that SRs measure the proportion of industry employment relative to the state average, and not the total number of jobs.

$$(1) \qquad SR_i = \frac{\left(\frac{E_{ir}}{E_r}\right)}{\left(\frac{E_{is}}{E_s}\right)}$$

Table 3.1.
Occupational Variables Defined Using Standard Occupational Classifications.

Variable	*Description*
SOC11	Management Occupations (SOC-11)
SOC13	Business and Financial Operations Occupations (SOC-13)
SOC15	Computer and Mathematical Science Occupations (SOC-15)
SOC17	Architecture and Engineering Occupations (SOC-17)
SOC19	Life, Physical and Social Science Occupations (SOC-19)
SOC21	Community and Social Services Occupations (SOC-21)
SOC23	Legal Occupations (SOC-23)
SOC25	Education, Training and Library Occupations (SOC-25)
SOC27	Arts, Design, Entertainment, Sports and Media Occupations (SOC-27)
SOC29	Healthcare Practitioner Occupations (SOC-29)
SOC31	Healthcare Support Occupations (SOC-31)
SOC33	Protective Service Occupations (SOC-33)
SOC35	Food Preparation and Serving Occupations (SOC-35)
SOC37	Building, Grounds and Maintenance Operations (SOC-37)
SOC39S1	Personal Services Occupations (SOC-392-394-395-399)
SOC39S2	Entertainment and Recreation Services Workers (SOC-393-396)
SOC41	Sales and Related Occupations (SOC-41)
SOC43	Office and Administrative Support Occupations (SOC-43)
SOC45	Farming, Fishing and Forestry Occupations (SOC-45)
SOC47	Construction and Extractive Occupations (SOC-47)
SOC49	Installation, Maintenance and Repair Occupations (SOC-49)
SOC51S1	Assembly and Fabrication Occupations (SOC-512)
SOC51S2	Food Processing Occupations (SOC-513)
SOC51S3	Metal and Plastic Production Occupations (SOC-514)
SOC51S4	Print, Textile, Apparel and Woodwork Production Occupations (SOC-515-516-517)
SOC51S5	Plant and System Operations Occupations (SOC-518)
SOC53	Transportation Occupations (SOC-531-532-533-534-535-536)

Source: Occupational Employment Statistics, MO Economic Research & Information Center.

Statistical Cluster Analysis

Cluster analysis is the generic name for a wide variety of procedures that can be used to create a classification. These procedures mathematically form clusters or groups of highly similar entities. More specifically, a clustering method is a multivariate statistical procedure that starts with data containing information about a sample of entities and attempts to reorganize these entities into relatively homogenous groups. In general, cluster analytic techniques are used to develop a classification or typology, to investigate conceptual schema for grouping entities, for hypothesis generation through data exploration or for hypothesis testing to determine if current typologies are actually present in the data.

Cluster analysis was used to group 347 industries according to their similarity along 27 occupational groups. Ward's hierarchical agglomerative cluster method was used to group cases into clusters. Ward's method is designed to optimize the minimum variance within clusters (Ward 1963). This objective is also a known as the within-groups sum of squares or the error sum of squares (ESS). The formula for ESS is given in equation (2).

$$(2) \qquad ESS = x_i^2 - 1/n\left(\sum x_i\right)^2$$

Here x_i is the score of the i^{th} case. At the first step of the clustering process, when each case is its own cluster, the ESS is zero. The method works by joining those groups or cases that result in the minimum increase in the ESS. Ward's method has a tendency to find or create clusters of relative equal sizes and shapes as hyperspheres (Aldenderfer and Blashfield 1984). However, Ward's method suffers in that it is sensitive to elevation.

To compute the distance between clusters and cases, the squared Euclidean distance measure was used in the analysis. This dissimilarity measure is appropriate for continuous interval-ratio data. Technically, all distance measures are best described as dissimilarity measures - a similarity measure (like a correlation coefficient) in reverse scale. Two cases are identical if each one is described by variables with the same magnitudes, with the distance being zero. Distance measures usually have no upper bound and are scale-dependent (Aldenderfer and Blashfield 1984). The formula for the squared Euclidean distance is given in equation (3).

$$(3) \qquad d_{ij} = \sqrt{\sum_{k=1}^{p}\left(x_{ik} - x_{jk}\right)^2}$$

Here d_{ij} is the distance between cases i and j, and x_{ik} is the value of the k^{th} variable for the i^{th} case. To avoid the use of the square root the distance is often squared, and thus is usually identified by the term d_{ij}^2.

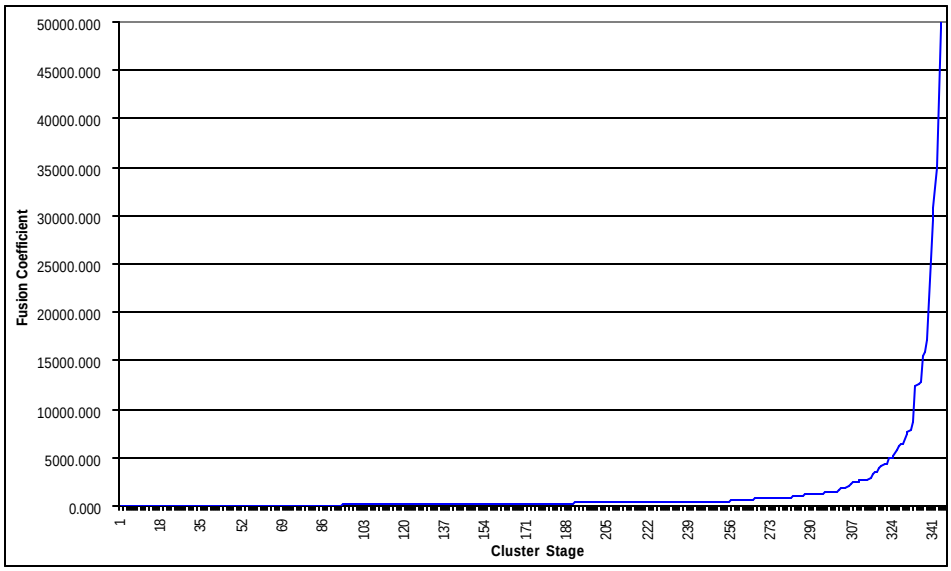
Lastly, the cluster solutions obtained using the above mentioned cluster method and distance measure was compared to other solutions using alternative methods and measures that include average within-groups linkage using squared Euclidean distance, and centroid method using squared Euclidean distance. All three methods yielded highly similar cluster solutions, indicating that there is an inherent structure in the data.

Determination of Clusters

According to Aldenderfer and Blashfield (1984), there are three main methods of determining an appropriate cluster solution: fusion coefficients, dendograms and Mojena's Stopping Rule 1. Determination of the appropriate number of clusters is difficult since no single agreed upon methodology exists for doing so. The lack of a workable null hypothesis and the complex nature of multivariate sampling distributions makes statistical tests of a cluster solution difficult. For example, there lacks a consistent and comprehensive definition of the structure and content of a cluster, and more importantly what the definition of no structure in the data would entail (Everitt 1979). Aldenderfer and Blashfield (1984) state that cluster determination is a subjective process, one where the analyst must decide on the appropriate number of clusters based on the information described above. Therefore, a 28-cluster solution was chosen based on the available evidence and related statistical tests. The 28 clusters and the industries they are composed of are listed in Appendix A.

Fusion coefficients are an index of the loss of information incurred when merging two clusters. A large loss of information – a jump in the fusion coefficients – implies that two relatively dissimilar clusters have been merged, thus the number of clusters prior to the merger is the most probable cluster solution (Aldenderfer and Blashfield 1984). There is a significant loss of information at stage 320 (Fusion=112165.95 $\text{Fusion}_{\text{change}}$=4208.84) and convention dictates that one takes the prior cluster stage, which results in a 28-cluster solution.

Figure 3.2.
Change in Fusion Coefficients.



In addition, examination of the dendogram indicates the presence of 26 to 28 clusters. Although dendograms are mainly heuristic devices, it provides an important validation of the cluster solution. Dendograms also permit the researcher to see where cases and clusters merge together to get a better understanding of the underlying structure of the data. The dendogram is presented in Appendix B.

Mojena's Stopping Rule 1 is a method of determining clusters based on the mean and standard deviation of all fusion coefficients (Mojena 1977). The Mojena method is a heuristic procedure by which a significant jump in the fusion coefficients can be better defined. Stopping Rule 1 states that a group level or optimal partition of a hierarchical clustering solution is selected that satisfies the inequality given in equation (4).

(4) $$\alpha_{j+1} > \mu_{\alpha} + k\sigma_{\alpha}$$

Where a is the fusion coefficient at stage j, μ is the mean of the fusion coefficients for all stages, k is a constant set at 1.25 and s is the standard deviation of the fusion coefficients for all stages (Milligan and Cooper 1985). The Mojena value (Mojena=145162.50) exceeded the fusion coefficient (Fusion=145217.72) at stage 323, thus indicating a 25-cluster solution.

The 28-cluster solution was also statistically validated using a variety of statistical tests. Multivariate analysis of variance (MANOVA) using the Pillais, Hotellings and Wilks statistics found highly significant differences between all 28 clusters. Univariate F-tests show that all occupational variables, except one, were significantly different between all 28 clusters at $p >$

0.05. Although the protective service occupations (SOC33) variable was not statistically significant, it closely approaches statistical significance.

Table 3.3.
Multivariate Analysis of Variance Tests of Significance - 28-Cluster Solution.

Multivariate Test	*Value*	*F-Test*	*Significance*
Pillais	16.1251	17.5188	0.000
Hotellings	128.5898	51.3432	0.000
Wilks	0.0009	42.0383	0.000

Lastly, ten clusters were selected as targeted industries for economic development in Missouri. Selection of these clusters was based upon the stated economic development goals of the Missouri Department of Economic Development and a Missouri Governor's initiative entitled the *21st Century Economic Summit: The Prosperity Dialogue*. In general, these policies seek to attract or expand businesses in Missouri, promote capital investment, improve economic competitiveness, increase personal wealth and create self sufficient communities. The State of Missouri intends to accomplish these goals through increasing sales abroad, training qualified workers, identifying appropriate sites and obtaining financial support. This analysis uses a cluster-specific policy approach to target state resources to identified industry clusters. This means that clusters are identified in order to direct state resources and programs towards specific industry clusters in Missouri. The following ten labor-based industry clusters will assist state policy makers in targeting programs to assist particular industry clusters that exist within Missouri. By targeting education and training programs towards specific occupations, policy makers can strengthen these industry clusters by increasing the availability and skill of needed labor components.

Table 3.4.
Targeted Labor-Based Industry Clusters in Missouri.

Arts and Media	Health Care
Banking	High Technology
Business and Organization Services	Information Technology
Education	Transportation
Finance and Insurance	Wholesale Trade and Purchasing

Table 3.5.
Univariate F-Tests - 28-Cluster Solution.

Occupational Variable	*F-Test*	*Significance*
Management Occupations (SOC11)	19.9324	0.000
Business and Financial Operations Occupations (SOC13)	32.5989	0.000
Computer and Mathematical Science Occupations (SOC15)	65.0366	0.000
Architecture and Engineering Occupations (SOC17)	9.2749	0.000
Life, Physical and Social Science Occupations (SOC19)	6.1733	0.000
Community and Social Services Occupations (SOC21)	1.6297	0.027
Legal Occupations (SOC23)	56.8185	0.000
Education, Training and Library Occupations (SOC25)	90.9798	0.000
Arts, Design, Entertainment, Sports and Media Occupations (SOC27)	37.3670	0.000
Healthcare Practitioner Occupations (SOC29)	20.6059	0.000
Healthcare Support Occupations (SOC31)	41.6663	0.000
Protective Service Occupations (SOC33)	1.4962	0.057
Food Preparation and Serving Occupations (SOC35)	35.0785	0.000
Building, Grounds and Maintenance Operations (SOC37)	42.0644	0.000
Personal Services Occupations (SOC39S1)	35.8585	0.000
Entertainment and Recreation Services Workers (SOC39S2)	2.9596	0.000
Sales and Related Occupations (SOC41)	173.2889	0.000
Office and Administrative Support Occupations (SOC43)	29.7723	0.000
Farming, Fishing and Forestry Occupations (SOC45)	86.4849	0.000
Construction and Extractive Occupations (SOC47)	194.1038	0.000
Installation, Maintenance and Repair Occupations (SOC49)	22.2602	0.000
Assembly and Fabrication Occupations (SOC51S1)	31.0516	0.000
Food Processing Occupations (SOC51S2)	26.1079	0.000
Metal and Plastic Production Occupations (SOC51S3)	69.4653	0.000
Print, Textile, Apparel and Woodwork Production Occupations (SOC51S4)	170.9324	0.000
Plant and System Operations Occupations (SOC51S5)	4.5033	0.000
Transportation Occupations (SOC53)	39.7439	0.000

IV. Targeted Labor-Based Industry Clusters

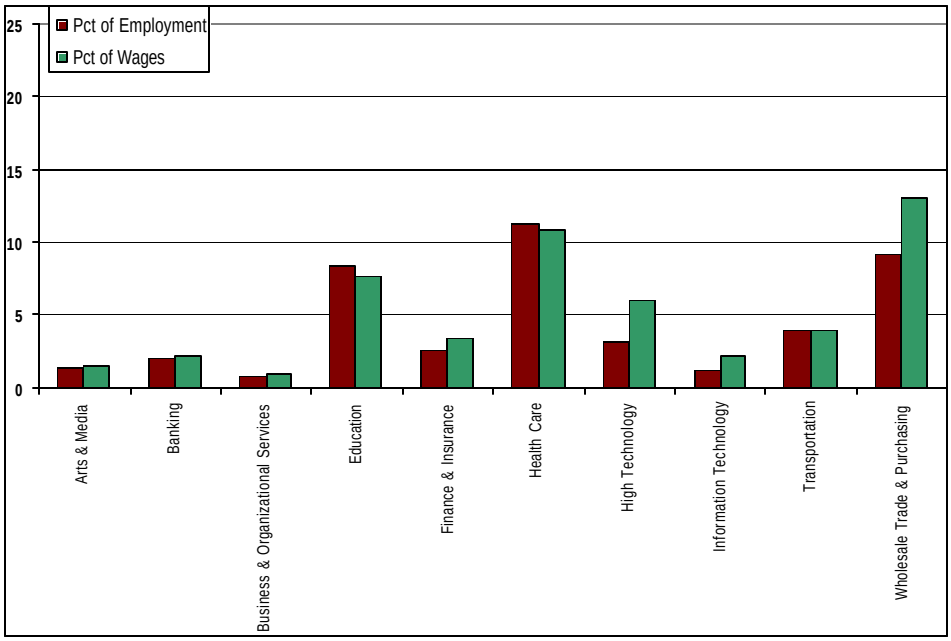
Collectively, the ten targeted industry clusters identified in the analysis have a substantial impact on Missouri's economy. In 2000, the targeted clusters generated 1.17 million jobs, which accounted for 43.93% of statewide employment. In turn these jobs generated $43.42 billion in wages, which accounted for 51.78% of statewide wages. The clusters pay an above average wage per job of $37,008, which was 117.86% of the state average wage per job. Over the past decade, wage growth has outpaced employment growth, resulting in higher wages per job. Since 1990, employment has grown by 17.92%, wages by 28.81% and average wages per job by 9.24%. In general, employment and wages were most concentrated in the education, health care and wholesale trade and purchasing clusters.

Table 4.1.
Targeted Industry Clusters - Economic Trends 1990-2000.

	1990		*2000*		*Pct Change*
Indicator	*Number*	*Pct of MO*	*Number*	*Pct of MO*	***1990-2000***
Employment	994,906	44.36%	1,173,193	43.93%	17.92%
Wages (millions$2000)	$33,706.22	52.58%	$43,417.81	51.78%	28.81%
Establishments	51,018	9.80%	66,301	10.23%	29.96%
Annual Wage Per Job ($2000)	$33,879	118.53%	$37,008	117.86%	9.24%

Source: Covered Employment & Wages, MO Economic Research & Information Center.

Figure 4.2.
Targeted Industry Clusters - Percent of Statewide Employment and Wages 2000.

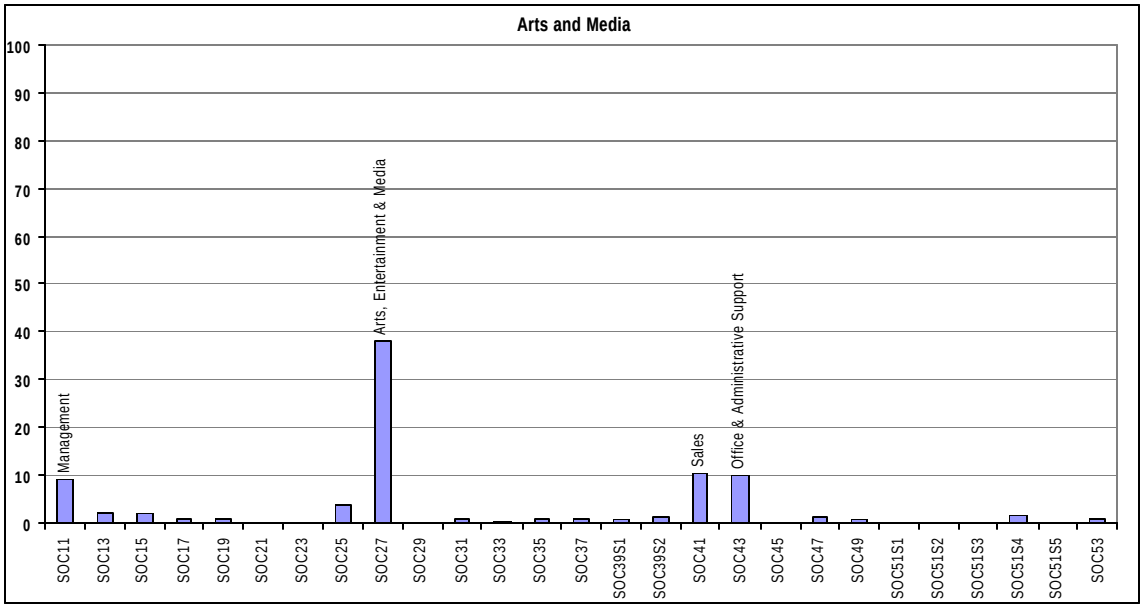


Source: Covered Employment & Wages, MO Economic Research & Information Center.

Arts and Media

The arts and media industry cluster includes establishments engaged in newspaper publishing, radio and television broadcasting, advertising services and the performing and fine arts. On average, industries in this cluster have a large portion of their workforce engaged in the following occupations: (1) 38.04% in arts, design, entertainment, sports and media occupations; (2) 10.17% in sales occupations; (3) 9.92% in office and administrative support occupations; and (4) 9.02% in management occupations.

Figure 4.3.
Arts & Media Industry Cluster - Percent Employment by Occupation.



Source: Occupational Employment Statistics, MO Economic Research & Information Center.

Table 4.4.
Arts & Media Industry Cluster - Industry Components.

Standard Industry Classification		*Standard Industry Classification*	
2710	Newspapers: Publishing & Printing	7810	Motion Picture Production & Allied Services
4830	Radio & Television Broadcasting Stations	7910	Dance Studios, Schools, & Halls
7220	Photographic Studios, Portrait	7920	Theatrical Producers
7310	Advertising	8990	Services, Not Elsewhere Classified
7330	Mailing, Commercial Art & Photography		

In 2000, the arts and media cluster generated 36,983 jobs, which accounted for 1.38% of employment statewide. In turn these jobs generated $1.22 billion in wages, which accounted for 1.45% of all wages paid statewide. Workers were employed in 3,050 establishments across Missouri, which accounted for 0.47% of all establishments statewide. The arts and media cluster pays a slightly above average wage per job of $32,973, which was 105.01% of the state average wage per job. Over the past decade wage growth has outpaced employment growth, resulting in higher wages per job. Since 1990, employment has grown by 16.38%, wages by 27.79% and average wages per job by 9.81%.

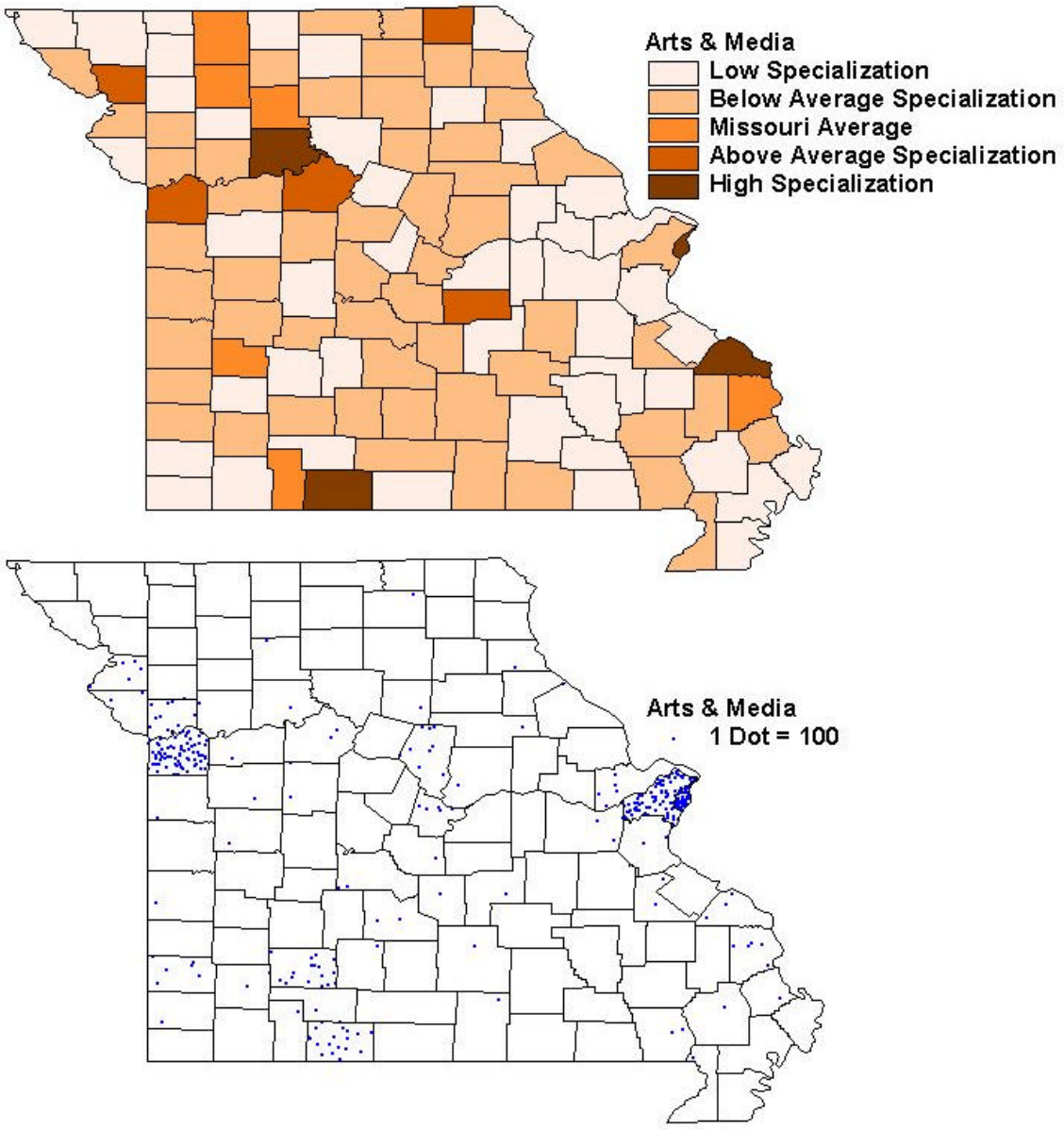
In 2000, the majority of arts and media jobs were located in the metropolitan and entertainment/recreation areas of the state. Counties with the largest employment base were St. Louis, Jackson (Kansas City), St. Louis City, Taney (Branson) and Greene (Springfield). According to specialization ratios, employment in this cluster was highly concentrated in several tourism areas of the state. The most highly specialized counties in arts and media employment were Taney (6.01), Perry (2.13), St. Louis City (1.84) and Carroll (1.64).

Table 4.5.
Arts & Media Industry Cluster - Economic Trends 1990-2000.

	1990		*2000*		*Pct Change*
Indicator	*Number*	*Pct of MO*	*Number*	*Pct of MO*	***1990-2000***
Employment	31,779	1.42%	36,983	1.38%	16.38%
Wages (millions $2000)	$954.27	1.49%	$1,219.46	1.45%	27.79%
Establishments	2,370	0.46%	3,050	0.47%	28.70%
Annual Wage Per Job ($2000)	$30,028	105.06%	$32,973	105.01%	9.81%

Source: Covered Employment & Wages, MO Economic Research & Information Center.

Figure 4.6.
Arts & Media Industry Cluster - Employment 2000.

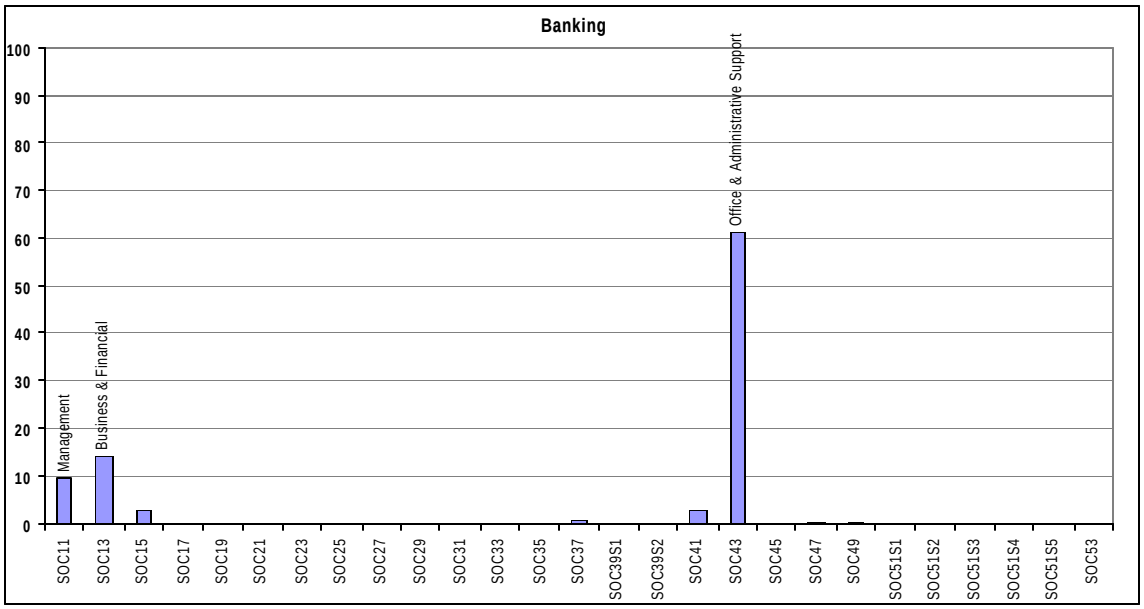


Source: Covered Employment & Wages, MO Economic Research & Information Center.

Banking

The banking industry cluster includes establishments engaged in banking, savings, credit and insurance services. On average, industries in this cluster have a large portion of their workforce engaged in the following occupations: (1) 61.26% in office and administrative support occupations; (2) 14.09% in business and financial operations occupations; and (3) 9.66% in management occupations.

Figure 4.7.
Banking Industry Cluster - Percent Employment by Occupation.



Source: Occupational Employment Statistics, MO Economic Research & Information Center.

Table 4.8.
Banking Industry Cluster - Industry Components.

Standard Industry Classification		*Standard Industry Classification*	
6020	Commercial Banks	6150	Business Credit Institutions
6030	Savings Institutions	6390	Insurance Carriers, Not Elsewhere Classified
6060	Credit Unions	7320	Consumer Credit Reporting Agencies
6090	Functions Related To Depository Banking		

In 2000, the banking cluster generated 55,223 jobs, which accounted for 2.07% of employment statewide. In turn these jobs generated $1.89 billion in wages, which accounted for 2.25% of all wages paid statewide. Workers were employed in 2,583 establishments across Missouri, which accounted for 0.40% of all establishments statewide. The banking cluster pays a slightly above average wage per job of $34,135, which was 108.71% of the state average wage per job. Over the past decade wage growth has far outpaced employment growth, resulting in higher wages per job. Since 1990, employment has grown by 10.04%, wages by 33.93% and average wages per job by 21.71%.

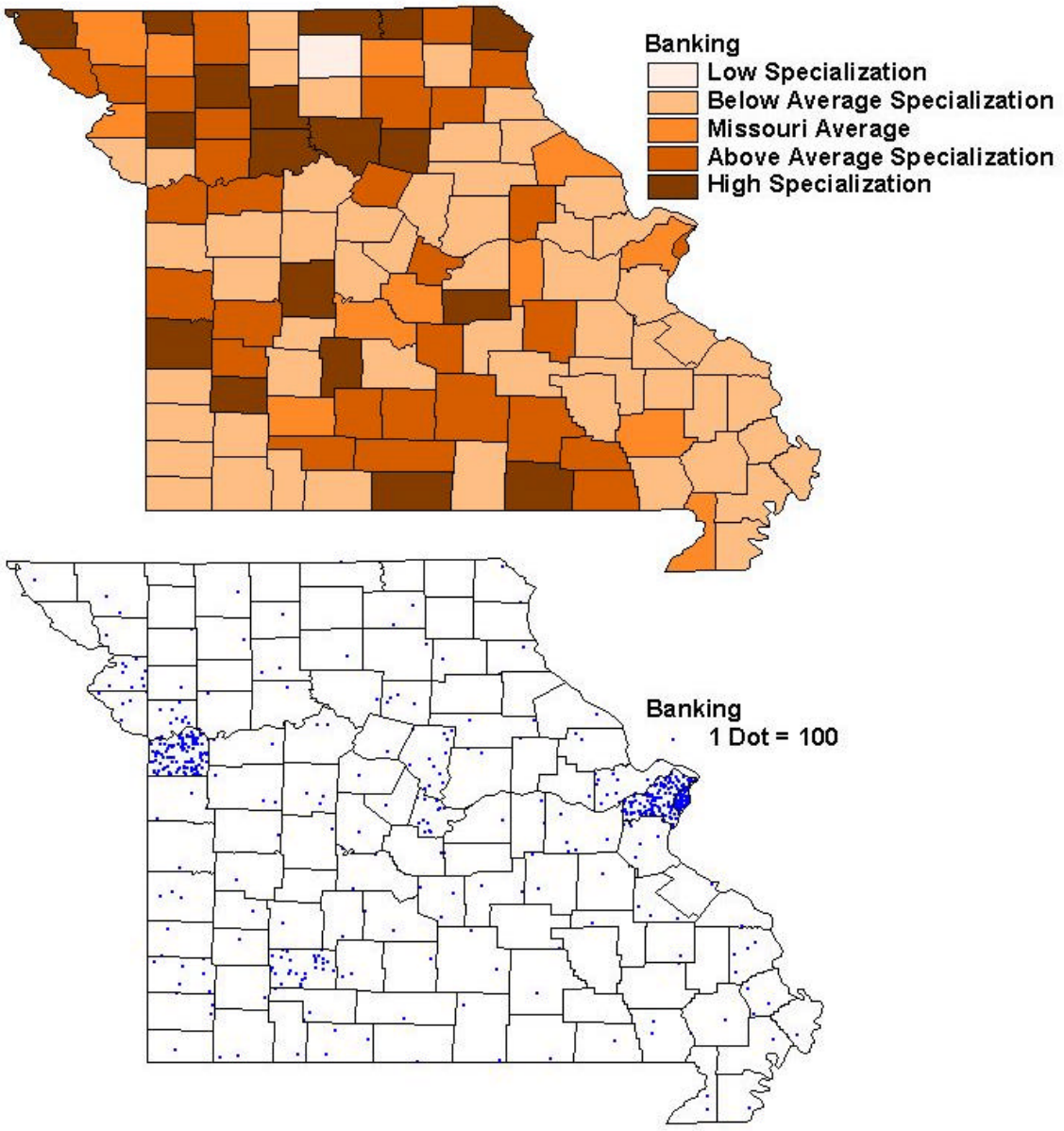
In 2000, the majority of banking jobs were located in the metropolitan areas of the state. Counties with the largest employment base were St. Louis, Jackson (Kansas City), St. Louis City, Greene (Springfield), Boone (Columbia), Cole (Jefferson City), St. Charles, Clay (Kansas City) and Buchanan (St. Joseph). According to specialization ratios, employment in this cluster was diffused throughout the state. The most highly specialized counties in banking employment were Putnam (2.72), Chariton (2.31), Daviess (2.13), Worth (2.04), Clark (1.91), Dallas (1.86), Randolph (1.80), Carroll (1.78), Vernon (1.76) and Ozark (1.72).

Table 4.9.
Banking Industry Cluster - Economic Trends 1990-2000.

	1990		2000		Pct Change
Indicator	*Number*	*Pct of MO*	*Number*	*Pct of MO*	***1990-2000***
Employment	50,184	2.24%	55,223	2.07%	10.04%
Wages (millions $2000)	$1,407.48	2.20%	$1,885.03	2.25%	33.93%
Establishments	2,265	0.43%	2,583	0.40%	14.08%
Annual Wage Per Job ($2000)	$28,046	98.13%	$34,135	108.71%	21.71%

Source: Covered Employment & Wages, MO Economic Research & Information Center.

Figure 4.10.
Banking Industry Cluster - Employment 2000.

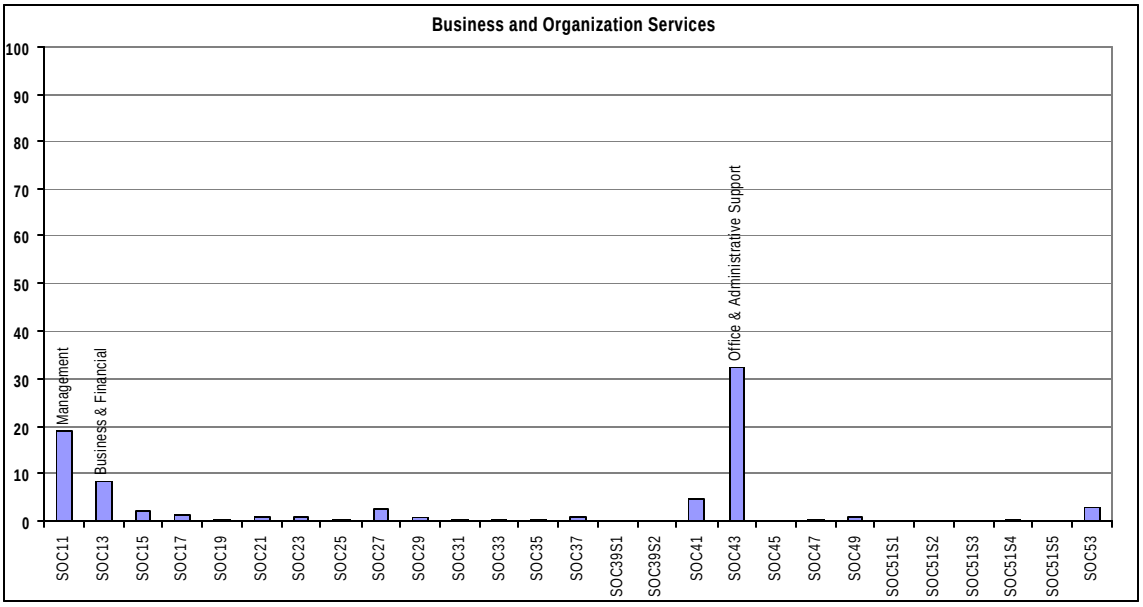


Source: Covered Employment & Wages, MO Economic Research & Information Center.

Business and Organization Services

The business and organization services industry cluster includes establishments engaged in storage and warehousing, transportation of freight, insurance and investment services and the operation of business and professional organizations. On average, industries in this cluster have a large portion of their workforce engaged in the following occupations: (1) 32.29% in office and administrative support occupations; (2) 18.98% in management occupations; and (3) 8.08% in business and financial operations occupations.

Figure 4.11.
Business & Organization Services Industry Cluster - Percent Employment by Occupation.



Source: Occupational Employment Statistics, MO Economic Research & Information Center.

Table 4.12.
Business & Organization Services Industry Cluster - Industry Components.

Standard Industry Classification		*Standard Industry Classification*	
2310	Men's And Boys' Suits, Coats, & Overcoats	6720	Investment Offices
3650	Household Audio & Video Equipment	6730	Trusts
4220	Public Warehousing And Storage	6790	Miscellaneous Investing
4230	Terminal & Terminal Maintenance Facilities	8390	Social Services, Not Elsewhere Classified
4730	Transportation Of Freight And Cargo	8610	Business Associations
6230	Security And Commodity Exchanges	8620	Professional Membership Organizations
6350	Surety Insurance	8650	Political Organizations
6710	Holding Offices	9010	Federal Govt Except Education & Hospitals

In 2000, the business and organization services cluster generated 18,871 jobs, which accounted for 0.71% of employment statewide. In turn these jobs generated $841.04 million in wages, which accounted for 1.00% of all wages paid statewide. Workers were employed in 2,149 establishments across Missouri, which accounted for 0.33% of all establishments statewide. The business and organization services cluster pays a well above average wage per job of $44,567, which was 141.94% of the state average wage per job. Over the past decade wage growth has far outpaced employment growth, resulting in higher wages per job. Since 1990, employment has grown only by 1.82%, wages by 26.21% and average wages per job by 23.95%.

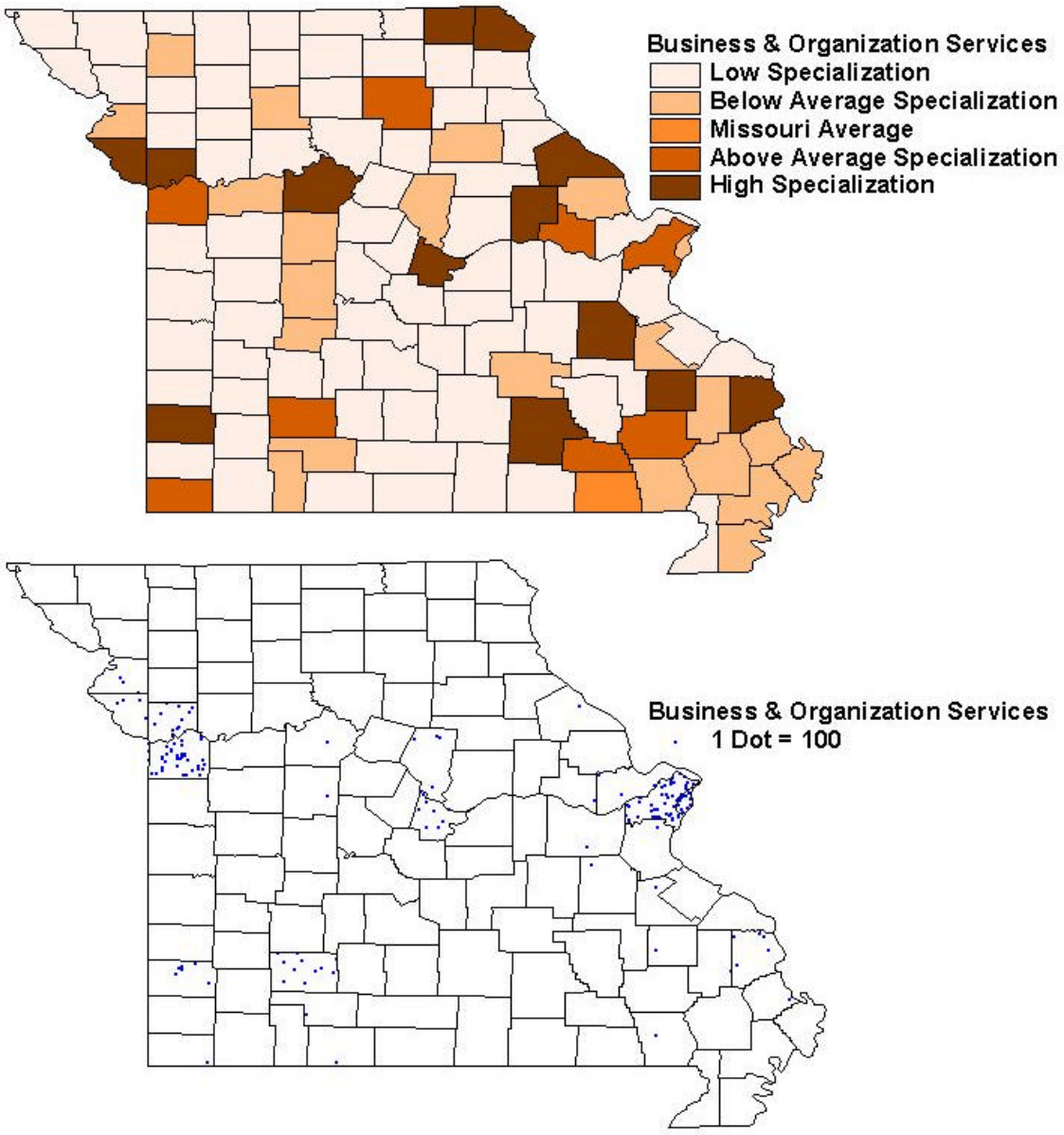
In 2000, the majority of business and organization services jobs were located in the metropolitan areas of the state. Counties with the largest employment base were St. Louis, Jackson (Kansas City), St. Louis City, Greene (Springfield), Clay (Kansas City) and Cole (Jefferson City). According to specialization ratios, employment in this cluster was concentrated in the regional trade centers of the state. The most highly specialized counties in business and organization services employment were Madison (5.17), Cole (2.54), Shannon (2.31), Pike (2.15), Cape Girardeau (2.07), Saline (1.94), Scotland (1.78), Clay (1.63), Montgomery (1.62) and Washington (1.61).

Table 4.13.
Business & Organization Services Industry Cluster - Economic Trends 1990-2000.

	1990		2000		Pct Change
Indicator	*Number*	*Pct of MO*	*Number*	*Pct of MO*	***1990-2000***
Employment	18,533	0.83%	18,871	0.71%	1.82%
Wages (millions $2000)	$666.37	1.04%	$841.04	1.00%	26.21%
Establishments	1,775	0.34%	2,149	0.33%	21.04%
Annual Wage Per Job ($2000)	$35,955	125.80%	$44,567	141.94%	23.95%

Source: Covered Employment & Wages, MO Economic Research & Information Center.

Figure 4.14.
Business & Organization Services Industry Cluster - Employment 2000.

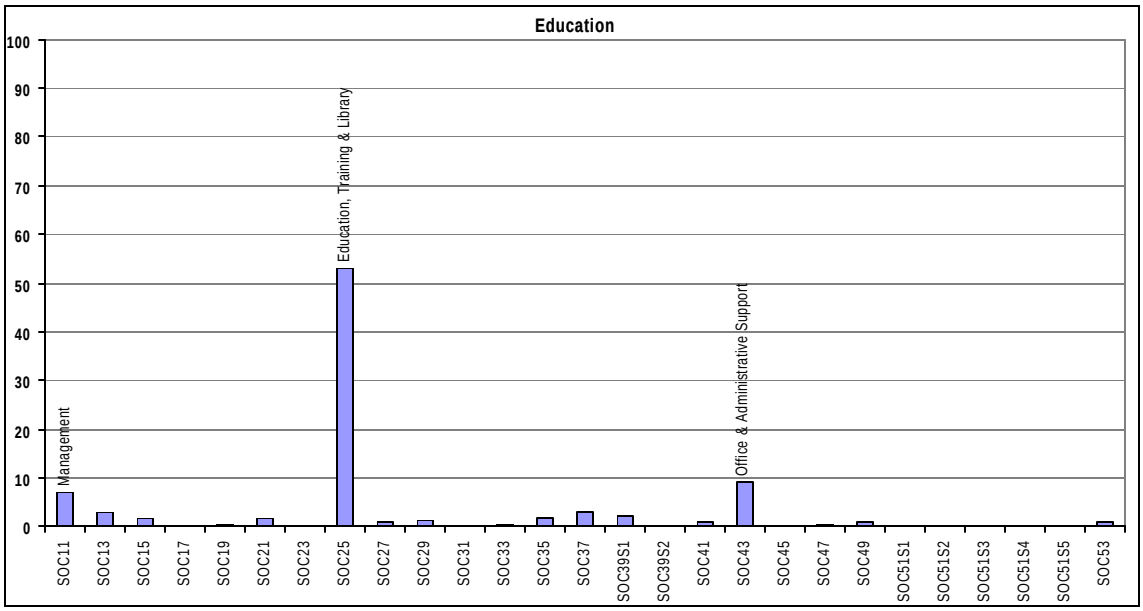


Source: Covered Employment & Wages, MO Economic Research & Information Center.

Education

The education industry cluster includes establishments engaged in elementary and secondary education, vocational education, college and university education, library services and child care services. On average, industries in this cluster have a large portion of their workforce engaged in the following occupations: (1) 52.81% in education, training and library occupations; (2) 9.27% in office and administrative support occupations; and (3) 7.03% in management occupations.

Figure 4.15.
Education Industry Cluster - Percent Employment by Occupation.



Source: Occupational Employment Statistics, MO Economic Research & Information Center.

Table 4.16.
Education Industry Cluster - Industry Components.

Standard Industry Classification		*Standard Industry Classification*	
8210	Elementary And Secondary Schools	8240	Vocational Schools
8220	Colleges, Universities And Junior Colleges	8290	Other Schools And Educational Services
8230	Libraries	8350	Child Day Care Services

In 2000, the education cluster generated 223,564 jobs, which accounted for 8.37% of employment statewide. In turn these jobs generated $6.42 billion in wages, which accounted for 7.66% of all wages paid statewide. Workers were employed in 4,713 establishments across Missouri, which accounted for 0.73% of all establishments statewide. The education cluster pays a below average wage per job of $28,736, which was only 91.52% of the state average wage per job. Over the past decade employment and wages have grown in step, although the number of establishments has grown immensely. Since 1990, employment has grown by 34.06%, wages by 34.34%, average wages per job by only 0.21% and establishments by a substantial 141.93%.

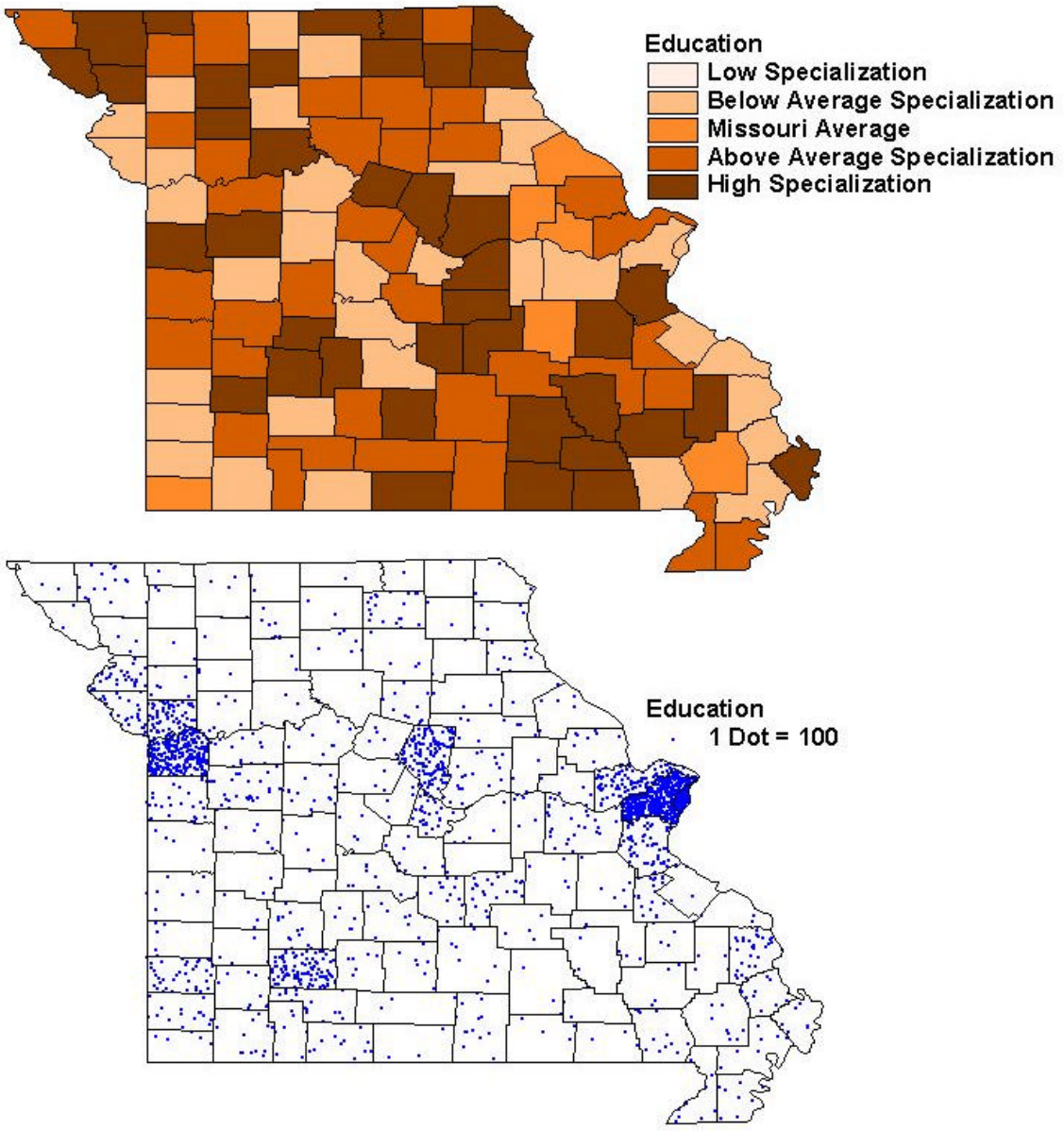
In 2000, the majority of education jobs were located in the metropolitan areas of the state. Counties with the largest employment base were St. Louis, Jackson (Kansas City), St. Louis City, Boone (Columbia), Greene (Springfield) and St. Charles. According to specialization ratios, employment in this cluster was diffused throughout the state. The most highly specialized counties in education employment were Caldwell (2.85), Ozark (2.59), Johnson (2.44), Howard (2.38), Carter (2.37), Worth (2.25), Lewis (2.16), Schuyler (2.15), Andrew (2.14) and Clark (2.14).

Table 4.17.
Education Industry Cluster - Economic Trends 1990-2000.

	1990		*2000*		*Pct Change*
Indicator	*Number*	*Pct of MO*	*Number*	*Pct of MO*	***1990-2000***
Employment	166,761	7.43%	223,564	8.37%	34.06%
Wages (millions $2000)	$4,781.99	7.46%	$6,424.36	7.66%	34.34%
Establishments	1,948	0.37%	4,713	0.73%	141.93%
Annual Wage Per Job ($2000)	$28,676	100.33%	$28,736	91.52%	0.21%

Source: Covered Employment & Wages, MO Economic Research & Information Center.

Figure 4.18.
Education Industry Cluster - Employment 2000.

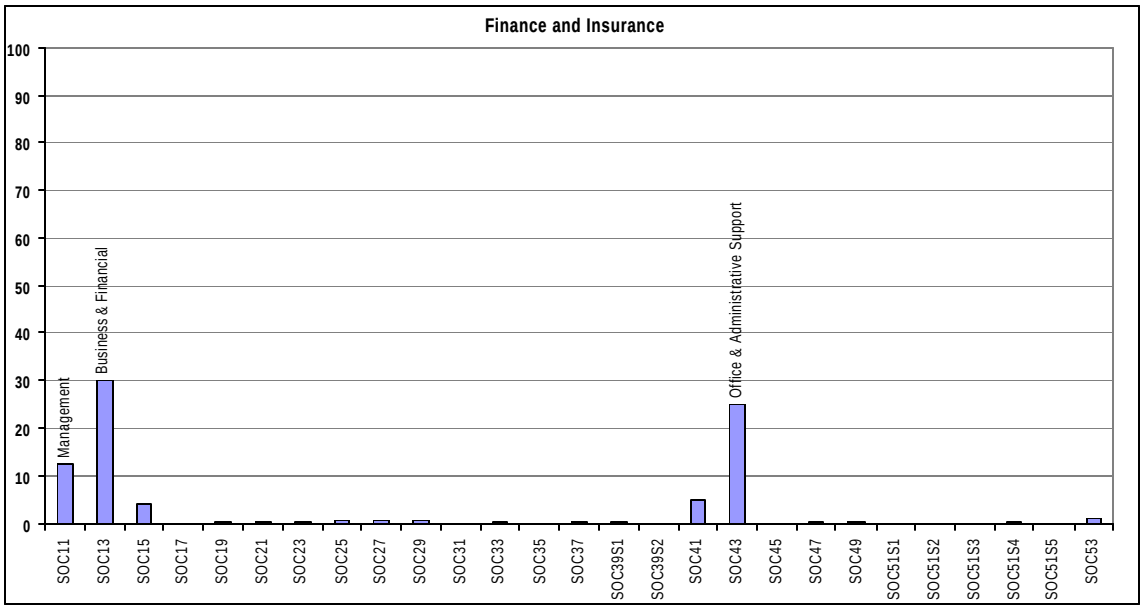


Source: Covered Employment & Wages, MO Economic Research & Information Center.

Finance and Insurance

The finance and insurance industry cluster includes establishments engaged in credit, mortgage, insurance, accounting, auditing and bookkeeping services. On average, industries in this cluster have a large portion of their workforce engaged in the following occupations: (1) 30.02% in business and financial operations occupations; (2) 24.83% in office and administrative support occupations; and (3) 12.75% in management occupations.

Figure 4.19.
Finance & Insurance Industry Cluster - Percent Employment by Occupation.



Source: Occupational Employment Statistics, MO Economic Research & Information Center.

Table 4.20.
Finance & Insurance Industry Cluster - Industry Components.

Standard Industry Classification		*Standard Industry Classification*	
4890	Other Communications Services	6320	Medical Service & Health Insurance
6010	Central Reserve Depository Institutions	6330	Fire, Marine, And Casualty Insurance
6110	Federal Credit Agencies	6370	Pension, Health, And Welfare Funds
6140	Personal Credit Institutions	7290	Miscellaneous Personal Services
6160	Mortgage Bankers And Brokers	8630	Labor Unions And Similar Labor Organizations
6280	Services Securities Or Commodities Exchg	8720	Accounting, Auditing, And Bookkeeping
6310	Life Insurance		

In 2000, the finance and insurance cluster generated 67,995 jobs, which accounted for 2.55% of employment statewide. In turn these jobs generated $2.88 billion in wages, which accounted for 3.44% of all wages paid statewide. Workers were employed in 5,427 establishments across Missouri, which accounted for 0.84% of all establishments statewide. The finance and insurance cluster pays a well above average wage per job of $42,400, which was 135.04% of the state average wage per job. Over the past decade wage growth has outpaced employment growth, resulting in higher wages per job. Since 1990, employment has grown by 14.38%, wages by 37.48% and average wages per job by 20.20%.

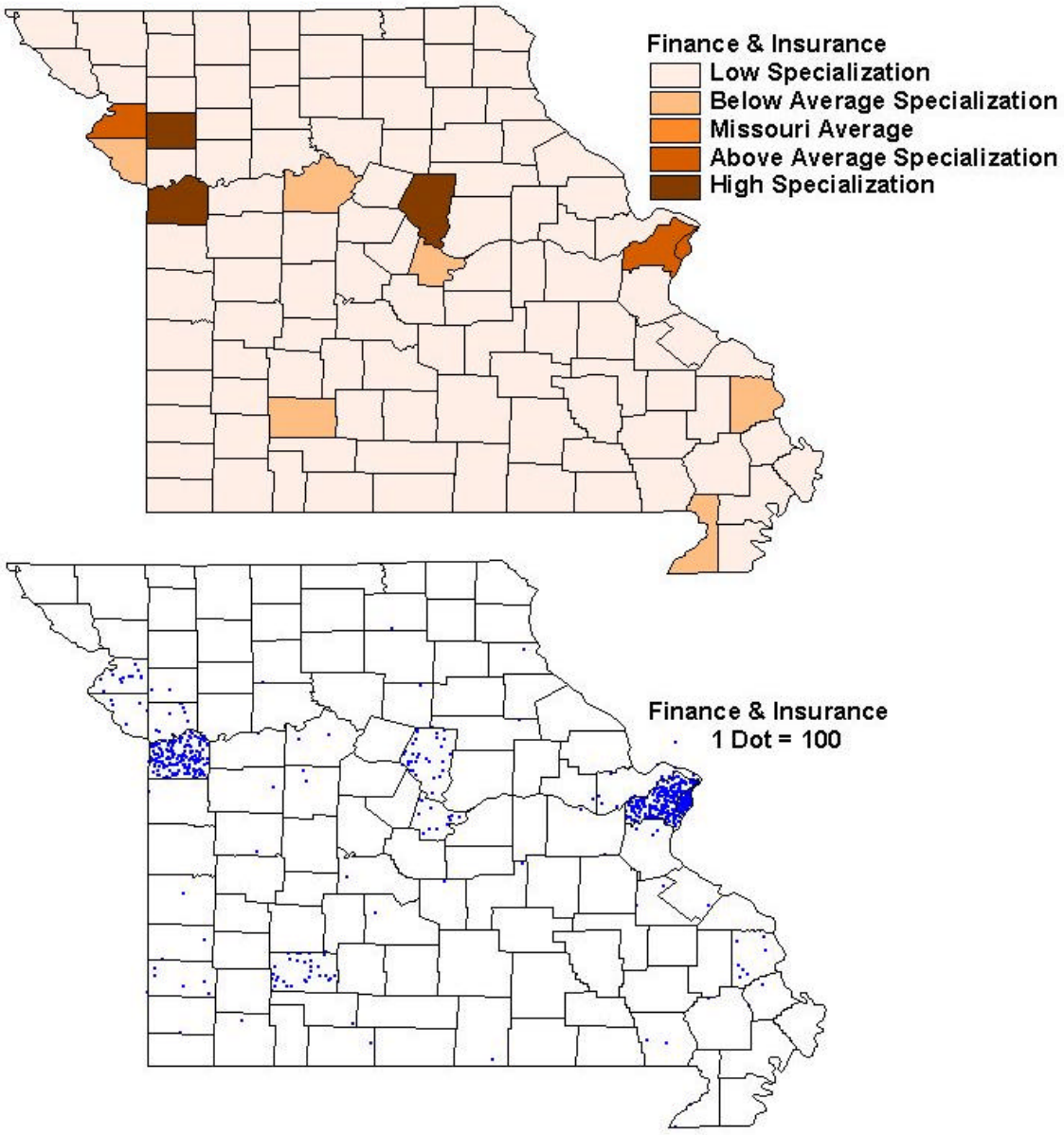
In 2000, the majority of finance and insurance jobs were located in the metropolitan areas of the state. Counties with the largest employment base were St. Louis, Jackson (Kansas City), St. Louis City, Greene (Springfield) and Boone (Columbia). According to specialization ratios, employment in this cluster was highly concentrated in major metropolitan areas of the state. The most highly specialized counties in education employment were Jackson (1.77), Boone (1.59) and Clinton (1.55).

Table 4.21.
Finance & Insurance Industry Cluster - Economic Trends 1990-2000.

	1990		2000		Pct Change
Indicator	*Number*	*Pct of MO*	*Number*	*Pct of MO*	***1990-2000***
Employment	59,447	2.65%	67,995	2.55%	14.38%
Wages (millions $2000)	$2,097.02	3.27%	$2,883.01	3.44%	37.48%
Establishments	4,159	0.80%	5,427	0.84%	30.47%
Annual Wage Per Job ($2000)	$35,275	123.42%	$42,400	135.04%	20.20%

Source: Covered Employment & Wages, MO Economic Research & Information Center.

Figure 4.22.
Finance & Insurance Industry Cluster - Employment 2000.

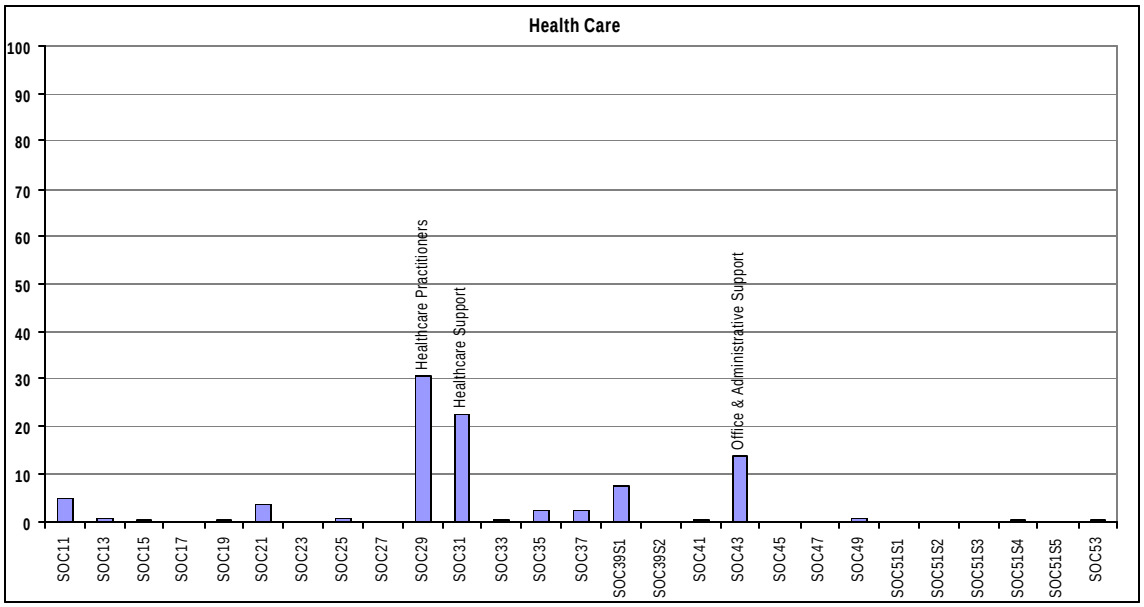


Source: Covered Employment & Wages, MO Economic Research & Information Center.

Health Care

The health care industry cluster includes establishments engaged in the provision of professional health care, hospital care, nursing and home health services and social services. On average, industries in this cluster have a large portion of their workforce engaged in the following occupations: (1) 30.67% in healthcare practitioner occupations; (2) 22.57% in healthcare support occupations; and (3) 13.93% in office and administrative support occupations.

Figure 4.23.
Health Care Industry Cluster - Percent Employment by Occupation.



Source: Occupational Employment Statistics, MO Economic Research & Information Center.

Table 4.24.
Health Care Industry Cluster - Industry Components.

Standard Industry Classification		*Standard Industry Classification*	
0740	Veterinary Services	8060	Hospitals
8010	Offices/Clinics Of Doctors Of Medicine	8070	Medical And Dental Laboratories
8020	Offices/Clinics Of Dentists	8080	Home Health Care Services
8030	Offices/Clinics Of Doctors Of Osteopathy	8320	Individual And Family Social Services
8040	Offices/Clinics Of Other Health Practitioners	8360	Residential Care
8050	Nursing And Personal Care Facilities		

In 2000, the health care cluster generated 302,202 jobs, which accounted for 11.32% of employment statewide. In turn these jobs generated $9.12 billion in wages, which accounted for 10.88% of all wages paid statewide. Workers were employed in 11,910 establishments across Missouri, which accounted for 1.84% of all establishments statewide. The health care cluster pays a slightly below average wage per job of $30,176, which was 96.10% of the state average wage per job. Over the past decade wage growth has slightly outpaced employment growth, resulting in higher wages per job. Since 1990, employment has grown by 21.07%, wages by 30.67% and average wages per job by 7.93%.

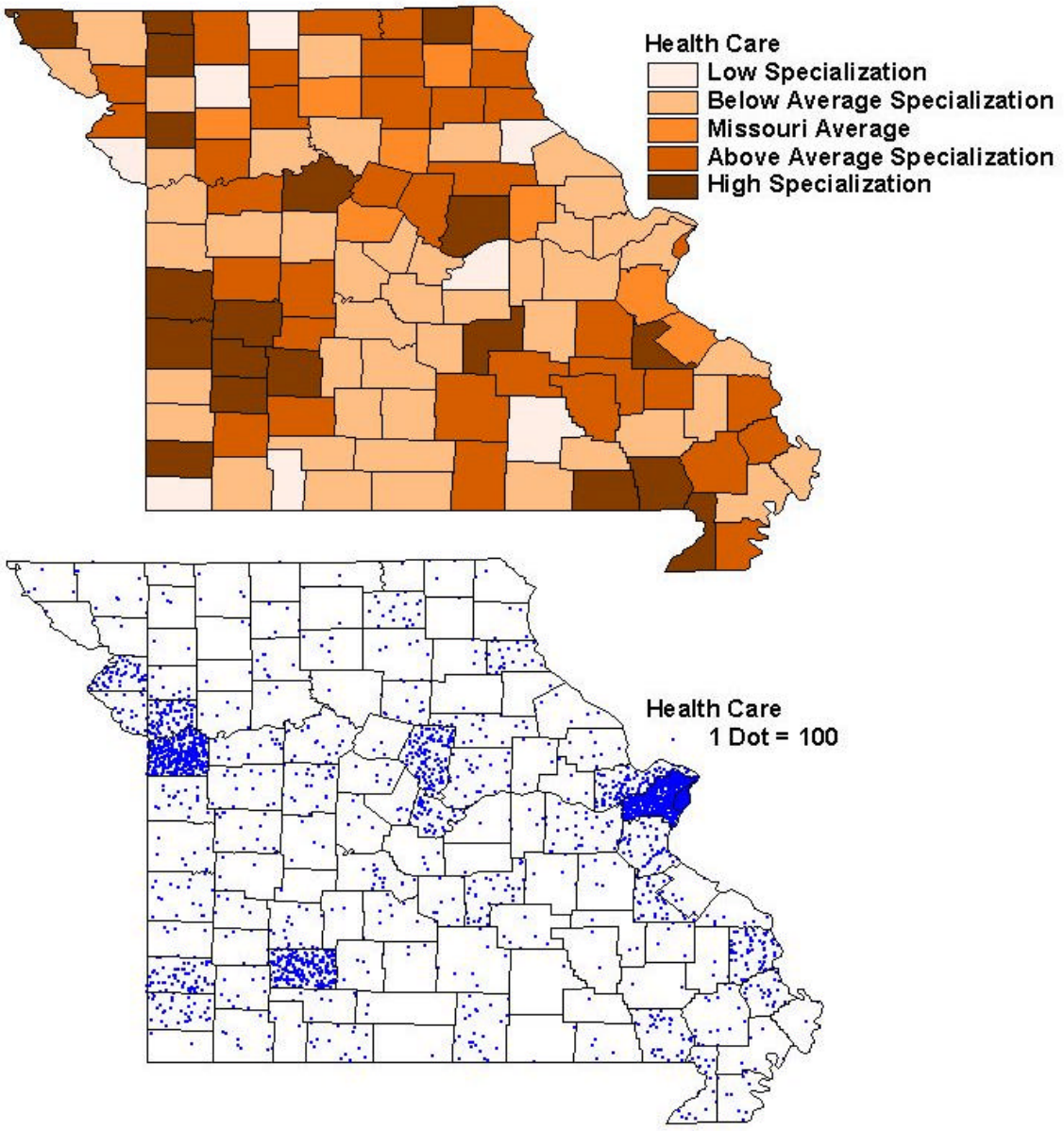
In 2000, the majority of health care jobs were located in the metropolitan areas of the state. Counties with the largest employment base were St. Louis, Jackson (Kansas City), St. Louis City, Greene (Springfield) and Boone (Columbia). According to specialization ratios, employment in this cluster was concentrated in the larger rural towns and regional trade centers, where health facilities are usually located. The most highly specialized counties in health care employment were St. Clair (2.10), Scotland (2.07), Atchison (1.96), Dunklin (1.89), Dade (1.87), Vernon (1.83), Butler (1.81), Saline (1.78), Phelps (1.74) and Clinton (1.73).

Table 4.25.
Health Care Industry Cluster - Economic Trends 1990-2000.

Indicator	*1990*		*2000*		*Pct Change 1990-2000*
	Number	*Pct of MO*	*Number*	*Pct of MO*	
Employment	249,605	11.13%	302,202	11.32%	21.07%
Wages (millions $2000)	$6,978.91	10.89%	$9,119.19	10.88%	30.67%
Establishments	9,806	1.88%	11,910	1.84%	21.46%
Annual Wage Per Job ($2000)	$27,960	97.82%	$30,176	96.10%	7.93%

Source: Covered Employment & Wages, MO Economic Research & Information Center.

Figure 4.26.
Health Care Industry Cluster - Employment 2000.

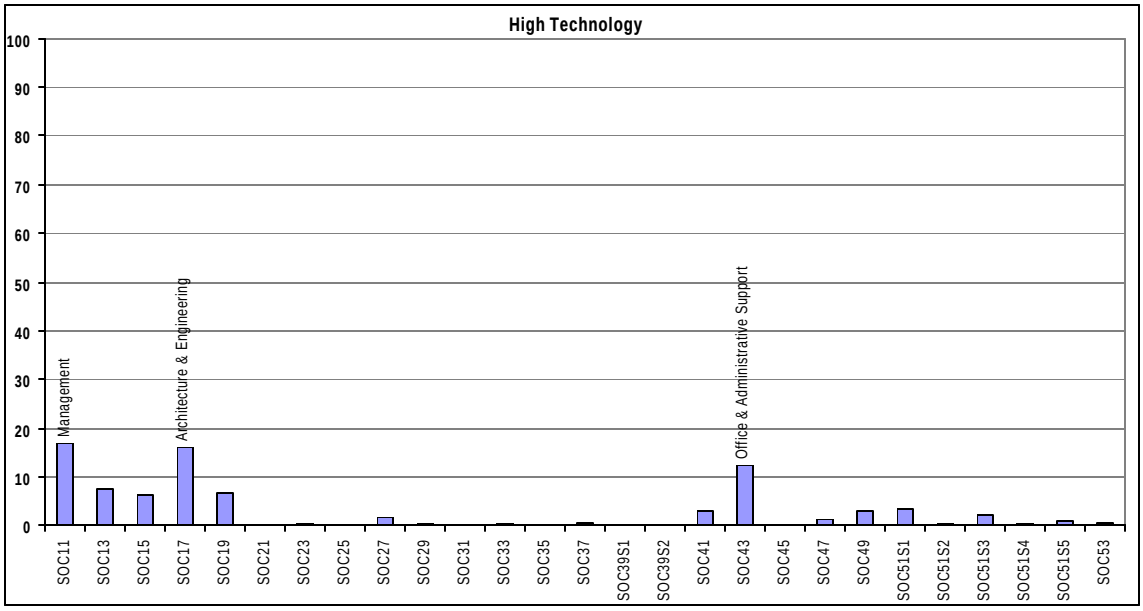


Source: Covered Employment & Wages, MO Economic Research & Information Center.

High Technology

The high technology industry cluster is composed of firms engaged in the manufacture of plastics, drugs, organic chemicals, communications equipment and aircraft and in providing engineering and architectural services. On average, industries in this cluster have a large portion of their workforce engaged in the following occupations: (1) 16.97% in management occupations; (2) 16.05% in architecture and engineering occupations; and (3) 12.28% in office and administrative support occupations.

Figure 4.27.
High Technology Industry Cluster - Percent Employment by Occupation.



Source: Occupational Employment Statistics, MO Economic Research & Information Center.

Table 4.28.
High Technology Industry Cluster - Industry Components.

Standard Industry Classification		*Standard Industry Classification*	
2070	Fats And Oils	3660	Communications Equipment
2080	Beverages	3720	Aircraft And Parts
2820	Plastics Materials And Synthetic Resins	3810	Search, Navigation, And Aeronautical
2830	Drugs	4740	Rental Of Railroad Cars
2850	Paints, Varnishes, Lacquers, & Enamels	8710	Engineering, Architectural, And Surveying
2860	Industrial Organic Chemicals	8730	Research, Development, And Testing Services
3480	Ordnance And Accessories	8740	Management And Public Relations Services

In 2000, the high technology cluster generated 85,909 jobs, which accounted for 3.22% of employment statewide. In turn these jobs generated $4.96 billion in wages, which accounted for 5.91% of all wages paid statewide. Workers were employed in 4,379 establishments across Missouri, which accounted for 0.68% of all establishments statewide. The high technology cluster pays a well above average wage per job of $57,678, which was 183.69% of the state average wage per job. Over the past decade employment and wages have declined, although there has been fast growth in establishments and moderate growth in average wages per job. Since 1990, employment has declined by -22.64% and wages by -10.94%, while establishments has grown by 39.65% and average wages per job by 15.11%. The declines are most likely attributable to decreased defense spending during the 1990s.

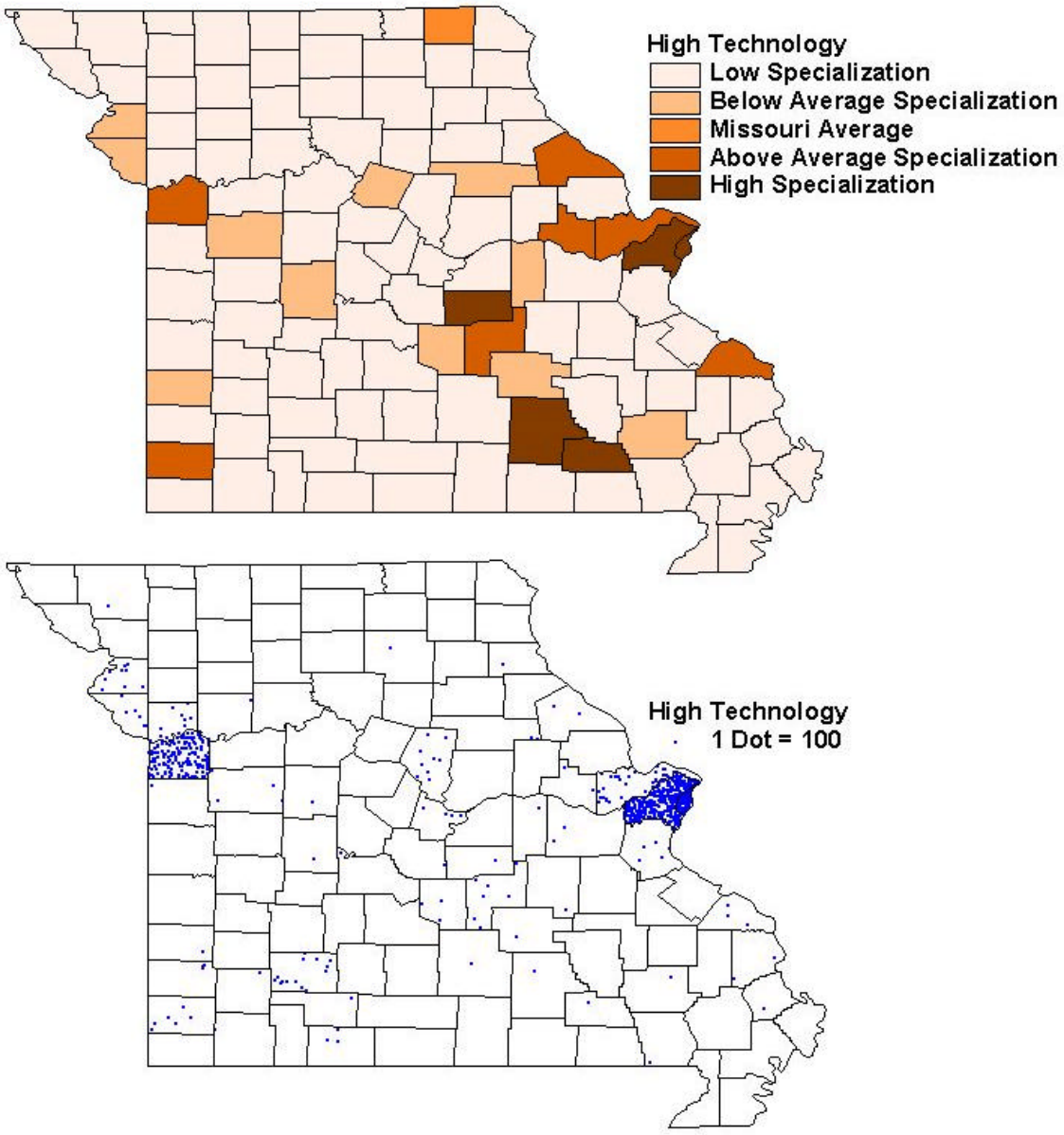
In 2000, the majority of high technology jobs were located in the metropolitan areas of the state. Counties with the largest employment base were St. Louis, Jackson (Kansas City) and St. Louis City. According to specialization ratios, employment in this cluster was highly concentrated in St. Louis and south central Missouri. The most highly specialized counties in high technology employment were Maries (2.68), St. Louis City (1.86), St. Louis (1.79), Shannon (1.70) and Carter (1.51).

Table 4.29.
High Technology Industry Cluster - Economic Trends 1990-2000.

	1990		*2000*		*Pct Change*
Indicator	*Number*	*Pct of MO*	*Number*	*Pct of MO*	***1990-2000***
Employment	111,045	4.95%	85,909	3.22%	-22.64%
Wages (millions $2000)	$5,563.95	8.68%	$4,955.08	5.91%	-10.94%
Establishments	3,136	0.60%	4,379	0.68%	39.65%
Annual Wage Per Job ($2000)	$50,105	175.30%	$57,678	183.69%	15.11%

Source: Covered Employment & Wages, MO Economic Research & Information Center.

Figure 4.30.
High Technology Industry Cluster - Employment 2000.

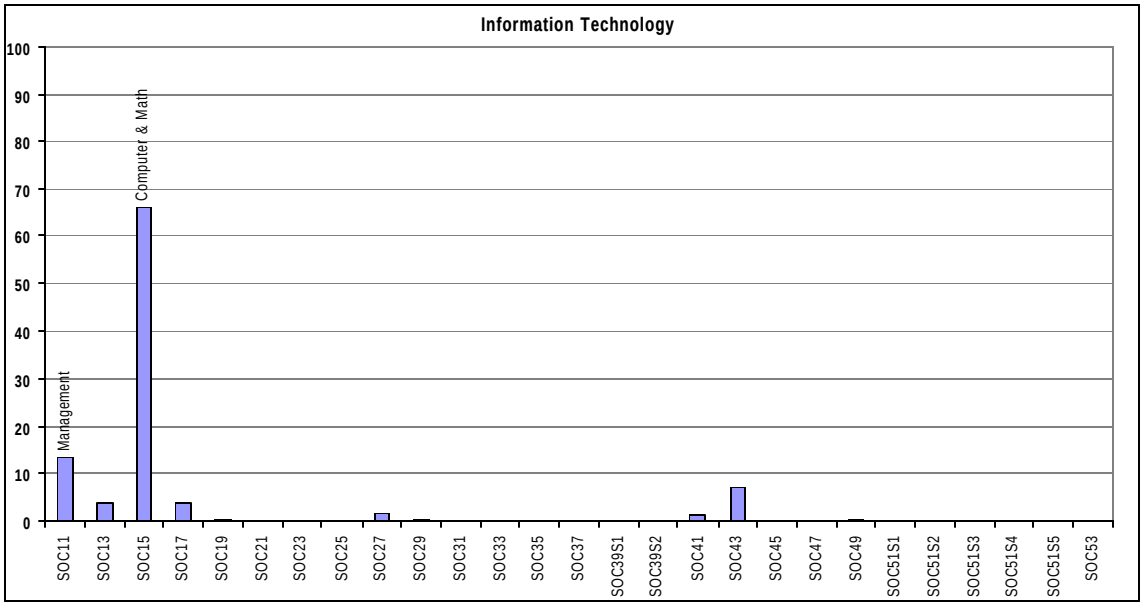


Source: Covered Employment & Wages, MO Economic Research & Information Center.

Information Technology

The information technology industry cluster is composed of firms engaged in communications, data processing and computer programming and computer services. On average, industries in this cluster have a large portion of their workforce engaged in the following occupations: (1) 66.27% in computer and mathematical science occupations; and (2) 13.31% in management occupations.

Figure 4.31.
Information Technology Industry Cluster - Percent Employment by Occupation.



Source: Occupational Employment Statistics, MO Economic Research & Information Center.

Table 4.32.
Information Technology Industry Cluster - Industry Components.

Standard Industry Classification		*Standard Industry Classification*	
4820	Telegraph & Message Communications	7370	Computer Programming, Data Processing, & Computer Services

In 2000, the information technology cluster generated 31,450 jobs, which accounted for 1.18% of employment statewide. In turn these jobs generated $1.89 billion in wages, which accounted for 2.25% of all wages paid statewide. Workers were employed in 3,059 establishments across Missouri, which accounted for 0.47% of all establishments statewide. The information technology cluster pays a well above average wage per job of $60,004, which was 191.10% of the state average wage per job. Over the past decade employment, wages and establishments have grown at a phenomenal rate. Since 1990, employment has grown by 179.31%, wages by 287.75%, establishments by 206.54% and average wages per job by 38.82%.

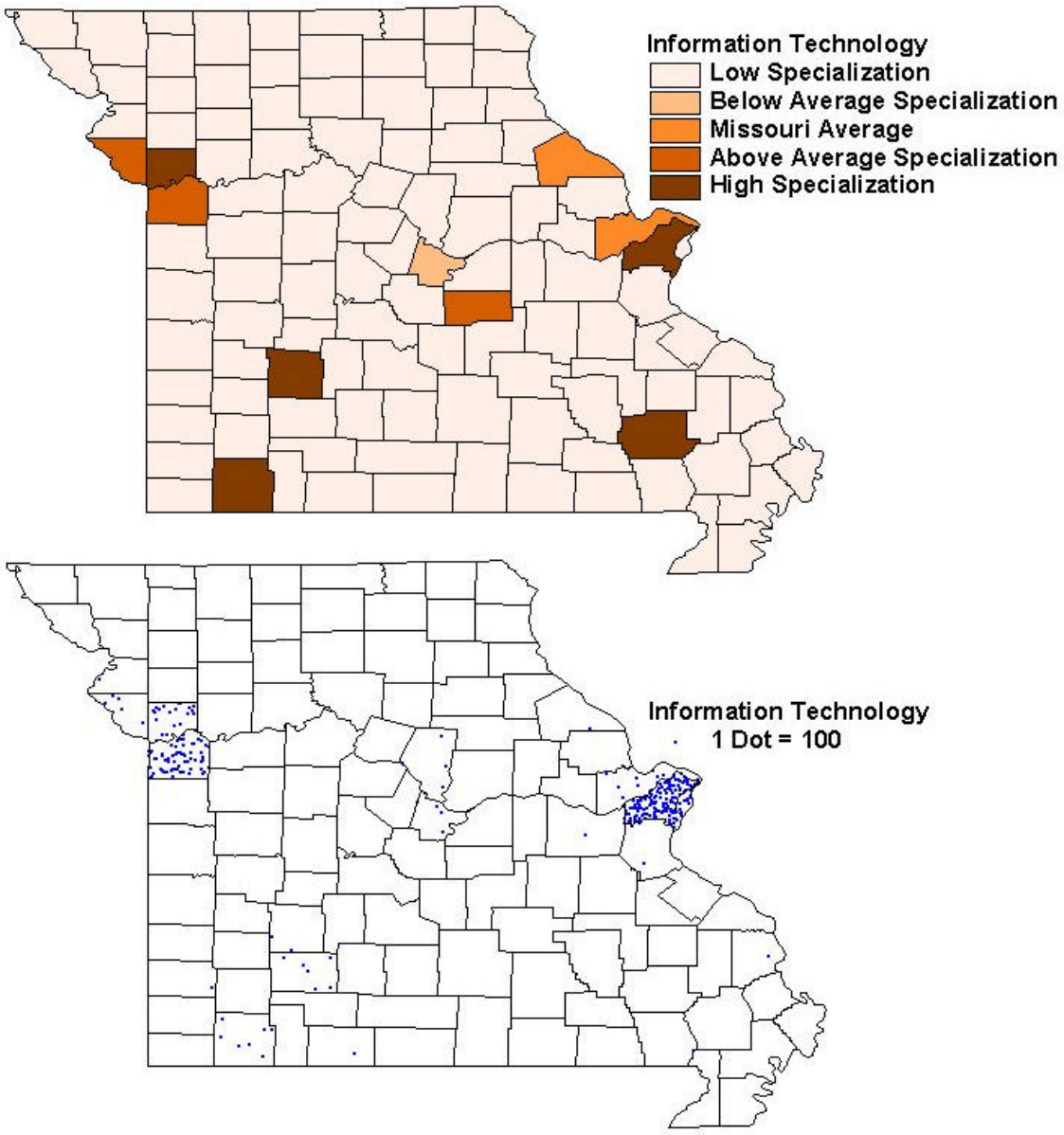
In 2000, the majority of information technology jobs were located in the metropolitan areas of the state. Counties with the largest employment base were St. Louis, Jackson (Kansas City), Clay (Kansas City), St. Louis City and St. Charles. According to specialization ratios, employment in this cluster was highly concentrated in the core metropolitan areas and in rural counties outside of Springfield. The most highly specialized counties in information technology employment were Barry (3.80), Clay (2.18), St. Louis (2.01), Polk (1.96) and Wayne (1.63).

Table 4.33.
Information Technology Industry Cluster - Economic Trends 1990-2000.

	1990		***2000***		***Pct Change***
Indicator	*Number*	*Pct of MO*	*Number*	*Pct of MO*	***1990-2000***
Employment	11,260	0.50%	31,450	1.18%	179.31%
Wages (millions $2000)	$486.68	0.76%	$1,887.10	2.25%	287.75%
Establishments	998	0.19%	3,059	0.47%	206.54%
Annual Wage Per Job ($2000)	$43,223	151.22%	$60,004	191.10%	38.82%

Source: Covered Employment & Wages, MO Economic Research & Information Center.

Figure 4.34.
Information Technology Industry Cluster - Employment 2000.

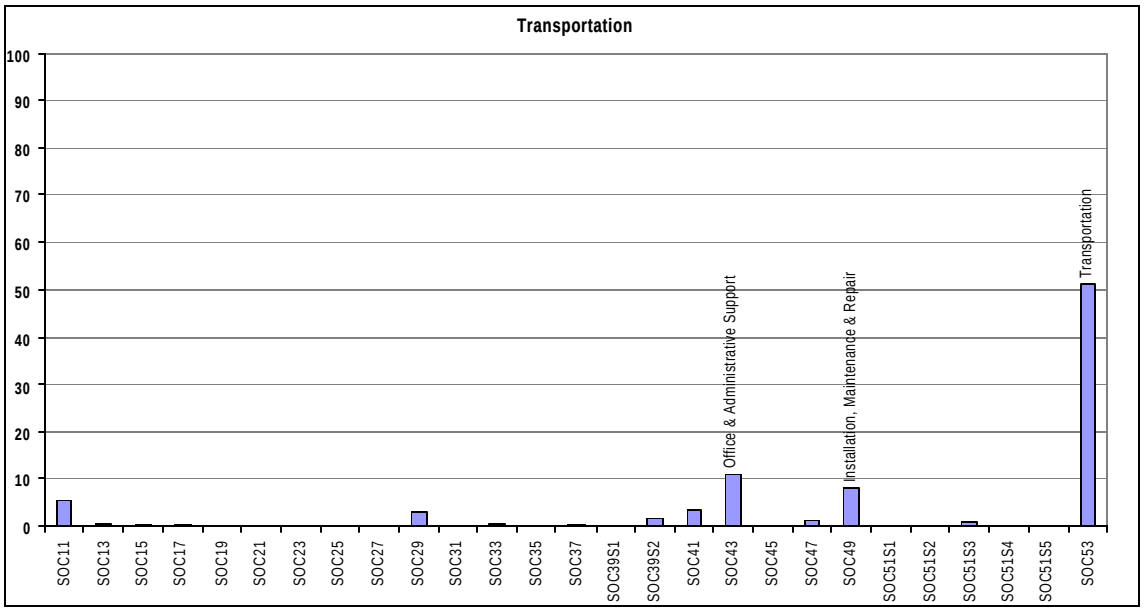


Source: Covered Employment & Wages, MO Economic Research & Information Center.

Transportation

The transportation industry cluster is composed of firms engaged in air, rail, truck and public transportation and related services. On average, industries in this cluster have a large portion of their workforce engaged in the following occupations: (1) 51.39% in transportation occupations; (2) 11.00% in office and administrative support occupations; and (3) 8.07% in installation, maintenance and repair occupations.

Figure 4.35.
Transportation Industry Cluster - Percent Employment by Occupation.



Source: Occupational Employment Statistics, MO Economic Research & Information Center.

Table 4.36.
Transportation Industry Cluster - Industry Components.

Standard Industry Classification		*Standard Industry Classification*	
3270	Concrete, Gypsum, And Plaster Products	4490	Services Incidental To Water Transportation
4010	Railroads	4510	Air Transportation - Scheduled & Air Courier
4110	Local & Suburban Passenger Transportation	4520	Air Transportation, Nonscheduled
4120	Taxicabs	4780	Miscellaneous Transportation Services
4130	Intercity And Rural Bus Transportation	5980	Fuel Dealers
4140	Bus Charter Service	7520	Automobile Parking
4150	School Buses	7540	Automotive Services, Except Repair
4210	Trucking And Courier Services, Except Air		

In 2000, the transportation cluster generated 105,260 jobs, which accounted for 3.94% of employment statewide. In turn these jobs generated $3.27 billion in wages, which accounted for 3.89% of all wages paid statewide. Workers were employed in 6,610 establishments across Missouri, which accounted for 1.02% of all establishments statewide. The transportation cluster pays a slightly below average wage per job of $31,019, which was 98.79% of the state average wage per job. Over the past decade, employment growth has slightly outpaced wage growth, resulting in lower wages per job. Since 1990, employment has grown by 16.65%, wages by 15.50% and average wages per job has declined by -0.99%.

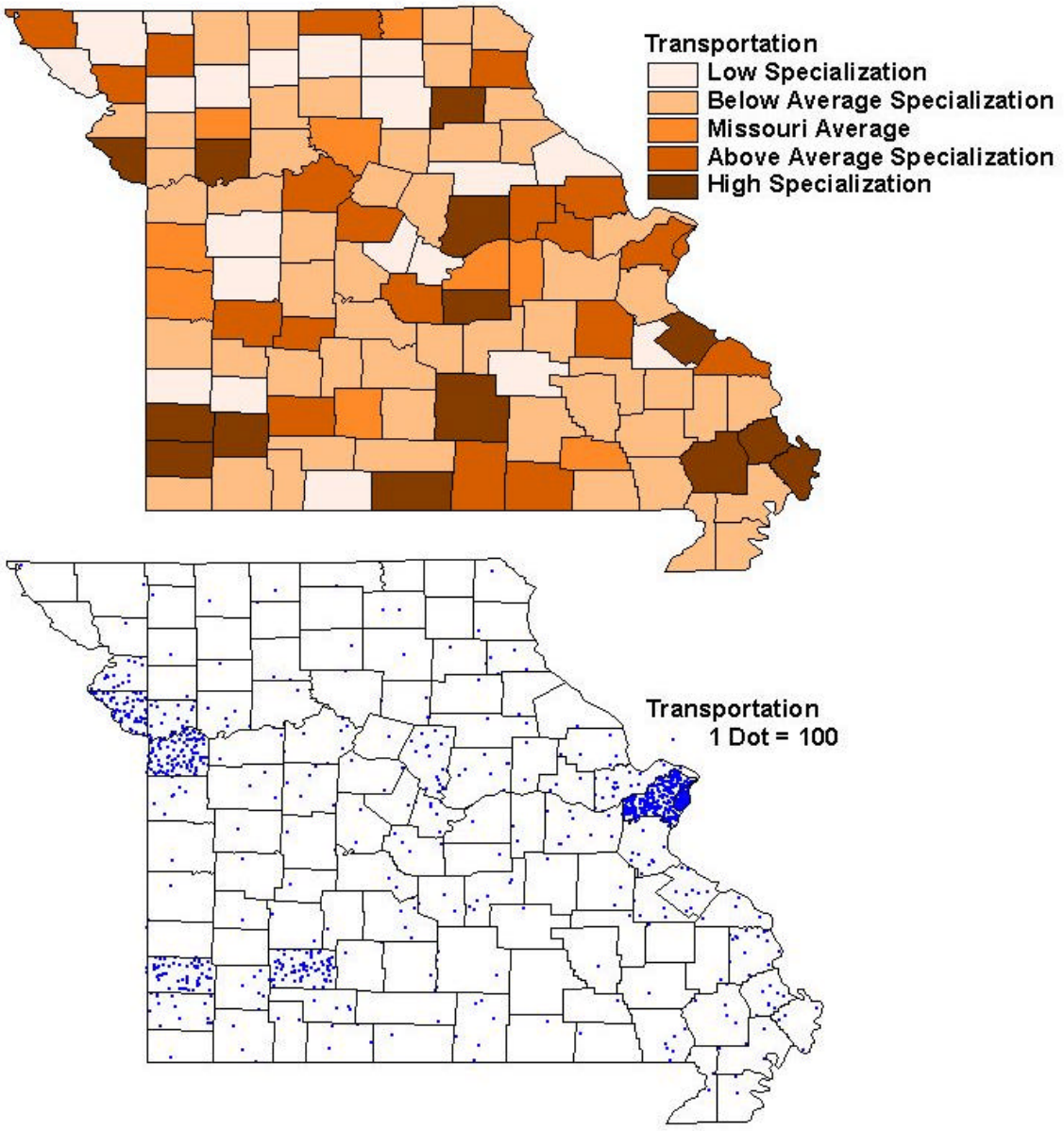
In 2000, the majority of transportation jobs were located in the metropolitan areas of the state. Counties with the largest employment base were St. Louis, St. Louis City, Jackson (Kansas City), Greene (Springfield), Platte (Kansas City) and Jasper (Joplin). According to specialization ratios, employment in this cluster was concentrated in the smaller metropolitan areas and in the larger rural towns, usually along rivers and interstates. The most highly specialized counties in transportation employment were Platte (4.79), Ste. Genevieve (4.08), Jasper (2.67), Ray (2.58), Mississippi (2.19), Newton (1.95), Texas (1.76), Maries (1.75), Shelby (1.69) and Lawrence (1.61).

Table 4.37.
Transportation Industry Cluster - Economic Trends 1990-2000.

Indicator	*1990*		*2000*		*Pct Change 1990-2000*
	Number	*Pct of MO*	*Number*	*Pct of MO*	
Employment	90,233	4.02%	105,260	3.94%	16.65%
Wages (millions $2000)	$2,826.94	4.41%	$3,265.05	3.89%	15.50%
Establishments	5,494	1.06%	6,610	1.02%	20.31%
Annual Wage Per Job ($2000)	$31,329	109.61%	$31,019	98.79%	-0.99%

Source: Covered Employment & Wages, MO Economic Research & Information Center.

Figure 4.38.
Transportation Industry Cluster - Employment 2000.

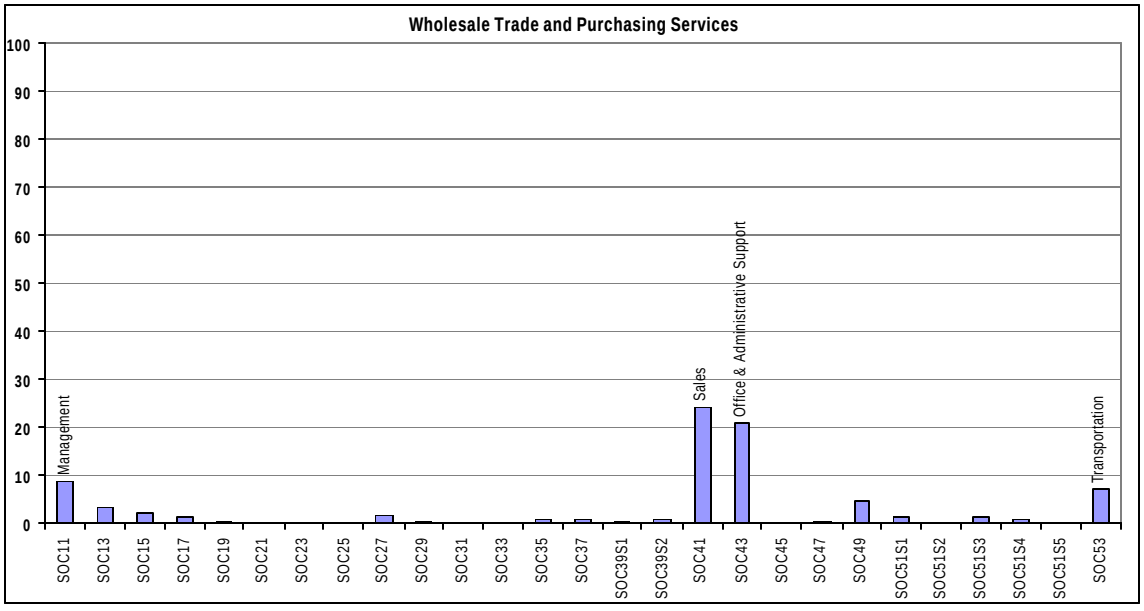


Source: Covered Employment & Wages, MO Economic Research & Information Center.

Wholesale Trade and Purchasing

The wholesale trade and purchasing industry cluster is composed of firms engaged in telecommunications sales and service, wholesale trade of durable and non-durable goods, insurance sales and miscellaneous business services. On average, industries in this cluster have a large portion of their workforce engaged in the following occupations: (1) 23.92% sales occupations; (2) 20.89% in office and administrative support occupations; (3) 8.84% management occupations; and (4) 7.25% in transportation occupations.

Figure 4.39.
Wholesale Trade & Purchasing Industry Cluster - Percent Employment by Occupation.



Source: Occupational Employment Statistics, MO Economic Research & Information Center.

Table 4.40.
Wholesale Trade & Purchasing Industry Cluster - Industry Components.

Standard Industry Classification		*Standard Industry Classification*	
1380	Oil And Gas Field Services	5120	Drugs, Proprietaries, And Sundries
2740	Miscellaneous Publishing	5130	Apparel, Piece Goods, And Notions
3010	Tires And Inner Tubes	5140	Groceries And Related Products
3860	Photographic Equipment And Supplies	5160	Chemicals And Allied Products
3910	Jewelry, Silverware, And Plated Ware	5170	Petroleum And Petroleum Products
4480	Water Transportation Of Passengers	5180	Beer, Wine, And Distilled Beverages
4810	Telephone Communication	5190	Miscellaneous Nondurable Goods
5010	Motor Vehicles, Parts, And Supplies	5590	Automotive Dealers, Not Elsewhere Classified
5020	Furniture And Homefurnishings	5960	Nonstore Retailers
5030	Lumber And Other Construction Materials	6210	Security Brokers, Dealers, And Flotation Estbs
5040	Professional And Commercial Equipment	6220	Commodity Contracts Brokers And Dealers
5050	Metals And Minerals, Except Petroleum	6410	Insurance Agents, Brokers, And Service
5060	Electrical Goods	7350	Miscellaneous Equipment Rental And Leasing
5070	Hardware, Plumbing And Heating Equipment	7510	Automotive Rentals And Leasing
5080	Machinery, Equipment, And Supplies	7820	Motion Picture Distribution And Allied Services
5090	Miscellaneous Durable Goods	8690	Membership Organizations
5110	Paper And Paper Products		

Source: Covered Employment & Wages, MO Economic Research & Information Center.

In 2000, the wholesale trade and purchasing cluster generated 245,736 jobs, which accounted for 9.20% of employment statewide. In turn these jobs generated $10.94 billion in wages, which accounted for 13.04% of all wages paid statewide. Workers were employed in 22,422 establishments across Missouri, which accounted for 3.46% of all establishments statewide. The wholesale trade and purchasing cluster pays a well above average wage per job of $44,513, which was 141.77% of the state average wage per job. Over the past decade, wage growth has outpaced employment growth, resulting in higher wages per job. Since 1990, employment has grown by 19.26%, wages by 37.72% and average wages per job by 15.48%.

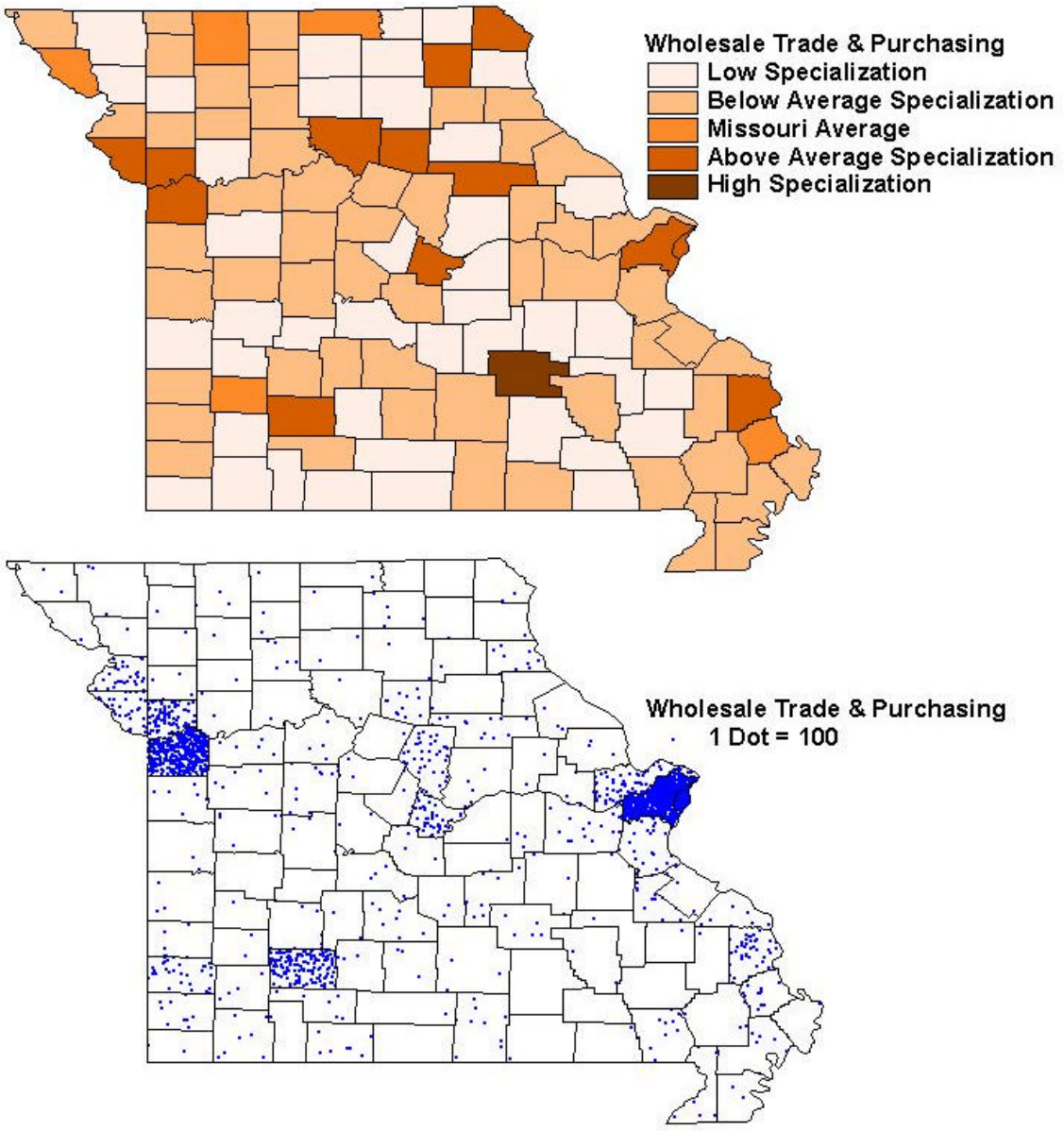
In 2000, the majority of wholesale trade and purchasing jobs were located in the metropolitan areas of the state. Counties with the largest employment base were St. Louis, Jackson (Kansas City), St. Louis City and Greene (Springfield). According to specialization ratios, employment in this cluster was concentrated in metropolitan areas and in regional trade centers. The only county highly specialized in wholesale trade and purchasing employment was Dent (1.66). Other counties with above average specialization were Randolph (1.31), St. Louis City (1.30), St. Louis (1.28), Jackson (1.22) and Greene (1.21).

Table 4.41.
Wholesale Trade & Purchasing Industry Cluster - Economic Trends 1990-2000.

	1990		2000		Pct Change
Indicator	*Number*	*Pct of MO*	*Number*	*Pct of MO*	***1990-2000***
Employment	206,059	9.19%	245,736	9.20%	19.26%
Wages (millions $2000)	$7,942.61	12.39%	$10,938.48	13.04%	37.72%
Establishments	19,067	3.66%	22,422	3.46%	17.60%
Annual Wage Per Job ($2000)	$38,545	134.86%	$44,513	141.77%	15.48%

Source: Covered Employment & Wages, MO Economic Research & Information Center.

Figure 4.42.
Wholesale Trade & Purchasing Industry Cluster - Employment 2000.



Source: Covered Employment & Wages, MO Economic Research & Information Center.

V. Conclusion

The results of this analysis have identified ten labor-based industry clusters, which are to be used for targeted economic development in Missouri. The arts and media cluster requires workers in arts, entertainment and media occupations. The banking cluster requires workers in office/administrative support, business and financial occupations. The business and organization services cluster requires workers in office/administrative support and management occupations. The education cluster requires workers in education, training and library occupations. The finance and insurance cluster requires workers in business, finance and management occupations. The health care cluster requires workers in the healthcare professions. The high technology cluster requires workers in management, architecture and engineering occupations. The information technology cluster requires workers in computer and mathematics occupations. The transportation cluster requires workers in transportation occupations. Lastly, the wholesale trade and purchasing cluster requires workers in sales, office/administrative support, management and transportation occupations.

Collectively, the ten targeted industry clusters identified in the analysis have a substantial impact on Missouri's economy. In 2000, the targeted clusters generated 1.17 million jobs, which accounted for 43.93% of statewide employment. In turn these jobs generated $43.42 billion in wages, which accounted for 51.78% of statewide wages. The clusters pay an above average wage per job of $37,008, which was 117.86% of the state average wage per job. Over the past decade, wage growth has outpaced employment growth, resulting in higher wages per job. Since 1990, employment has grown by 17.92%, wages by 28.81% and average wages per job by 9.24%.

However, the individual targeted clusters are quite distinct in their characteristics. Clusters with the highest employment base were the health care cluster (302,202 jobs or 11.32% of state employment), the wholesale trade and purchasing cluster (245,736 jobs or 9.20% of state employment) and the education cluster (223,564 jobs or 8.37% of state employment). Clusters with the fastest employment growth since 1990 were the information technology cluster (179.31% growth), the education cluster (34.06% growth) and the health care cluster (21.07% growth). Lastly, clusters with the highest average wages per job were the information technology cluster ($60,004 per job), the high technology cluster ($57,678 per job), the business and organization services cluster ($44,567 per job) and the wholesale trade and purchasing cluster ($44,513 per job).

Based on the results of a statistical cluster analysis, 28 clusters were identified using occupational or labor requirements for a range of industries. Selection of the ten target clusters was based upon the stated economic development goals of the Missouri Department of Economic

Development and a Missouri Governor's initiative entitled the *21st Century Economic Summit: The Prosperity Dialogue*. In general, these policies seek to attract or expand businesses in Missouri, promote capital investment, improve economic competitiveness, increase personal wealth and create self sufficient communities. Therefore, this analysis uses a cluster-specific policy approach to target state resources to identified industry clusters. This means that clusters were identified in order to direct state resources and programs towards specific industry clusters in Missouri. The selected ten labor-based industry clusters will assist state policy makers in targeting programs to assist particular industry clusters that exist within Missouri. By targeting education and training programs towards specific occupations, policy makers can strengthen these industry clusters by increasing the availability and skill of needed labor components.

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Appendix A - Labor-Based Industry Clusters

CLUSTER	CLUSTER NAME	SIC	SICDESC
1	Lodging & Building Services	0710	Soil Preparation Services
1	Lodging & Building Services	0780	Landscape And Horticultural Services
1	Lodging & Building Services	7010	Hotels And Motels
1	Lodging & Building Services	7020	Rooming And Boarding Houses
1	Lodging & Building Services	7030	Camps And Recreational Vehicle Parks
1	Lodging & Building Services	7040	Organization Hotels And Lodging Houses
1	Lodging & Building Services	7340	Services To Dwellings And Other Buildings
1	Lodging & Building Services	7940	Commercial Sports
2	Agriculture & Forestry	0720	Crop Services
2	Agriculture & Forestry	2410	Logging
3	Health Care	0740	Veterinary Services
3	Health Care	8010	Offices And Clinics Of Doctors Of Medicine
3	Health Care	8020	Offices And Clinics Of Dentists
3	Health Care	8030	Offices And Clinics Of Doctors Of Osteopathy
3	Health Care	8040	Offices And Clinics Of Other Health Practitioners
3	Health Care	8050	Nursing And Personal Care Facilities
3	Health Care	8060	Hospitals
3	Health Care	8070	Medical And Dental Laboratories
3	Health Care	8080	Home Health Care Services
3	Health Care	8320	Individual And Family Social Services
3	Health Care	8360	Residential Care
4	Non-Specific	0750	Animal Services, Except Veterinary
4	Non-Specific	1480	Nonmetallic Minerals Services, Except Fuels
4	Non-Specific	1490	Miscellaneous Nonmetallic Minerals
4	Non-Specific	2020	Dairy Products
4	Non-Specific	2040	Grain Mill Products
4	Non-Specific	2060	Sugar And Confectionery Products
4	Non-Specific	2630	Paperboard Mills
4	Non-Specific	2650	Paperboard Containers And Boxes
4	Non-Specific	2670	Converted Paper And Paperboard Products, Except Containers
4	Non-Specific	2810	Industrial Inorganic Chemicals
4	Non-Specific	2840	Soap, Detergents, And Cleaning Preparations
4	Non-Specific	2890	Miscellaneous Chemical Products
4	Non-Specific	2950	Asphalt Paving And Roofing Materials
4	Non-Specific	2990	Miscellaneous Products Of Petroleum And Coal
4	Non-Specific	3110	Leather Tanning And Finishing
4	Non-Specific	3220	Glass And Glassware, Pressed Or Blown
4	Non-Specific	3250	Structural Clay Products
4	Non-Specific	3260	Pottery And Related Products
4	Non-Specific	3280	Cut Stone And Stone Products
4	Non-Specific	3290	Abrasive, Asbestos, And Miscellaneous Nonmetallic Mineral Products
4	Non-Specific	3410	Metal Cans And Shipping Containers
4	Non-Specific	3950	Pens, Pencils And Other Artist Materials
4	Non-Specific	4580	Airports, Flying Fields, And Airport Terminal Services
4	Non-Specific	5150	Farm-Product Raw Materials
4	Non-Specific	6510	Real Estate Operators (Except Developers) And Lessors
4	Non-Specific	6530	Real Estate Agents And Managers
4	Non-Specific	7260	Funeral Service And Crematories
4	Non-Specific	7360	Personnel Supply Services
4	Non-Specific	7380	Miscellaneous Business Services
4	Non-Specific	7630	Watch, Clock, And Jewelry Repair

4	Non-Specific	8090	Miscellaneous Health And Allied Services
4	Non-Specific	8330	Job Training And Vocational Rehabilitation Services
4	Non-Specific	8410	Museums And Art Galleries
4	Non-Specific	8420	Arboreta And Botanical Or Zoological Gardens
4	Non-Specific	8640	Civic, Social, And Fraternal Associations
4	Non-Specific	8660	Religious Organizations
4	Non-Specific	9020	State Government Except Education And Hospitals
4	Non-Specific	9030	Local Government Except Education And Hospitals
5	Professional Management Services	0760	Farm Labor And Management Services
5	Professional Management Services	1310	Crude Petroleum And Natural Gas
6	Construction	1030	Lead And Zinc Ores
6	Construction	1080	Metal Mining Services
6	Construction	1220	Bituminous Coal And Lignite Mining
6	Construction	1410	Dimension Stone
6	Construction	1520	General Building Contractors-Residential Buildings
6	Construction	1540	General Building Contractors-Nonresidential Buildings
6	Construction	1610	Highway And Street Construction, Except Elevated Highways
6	Construction	1620	Heavy Construction, Except Highway And Street Construction
6	Construction	1710	Plumbing, Heating And Air-Conditioning
6	Construction	1720	Painting And Paper Hanging
6	Construction	1730	Electrical Work
6	Construction	1740	Masonry, Stonework, Tile Setting, And Plastering
6	Construction	1750	Carpentry And Floor Work
6	Construction	1760	Roofing, Siding, And Sheet Metal Work
6	Construction	1770	Concrete Work
6	Construction	1780	Water Well Drilling
6	Construction	1790	Miscellaneous Special Trade Contractors
6	Construction	2450	Wood Buildings And Mobile Homes
7	Wholesale Trade & Purchasing	1380	Oil And Gas Field Services
7	Wholesale Trade & Purchasing	2740	Miscellaneous Publishing
7	Wholesale Trade & Purchasing	3010	Tires And Inner Tubes
7	Wholesale Trade & Purchasing	3860	Photographic Equipment And Supplies
7	Wholesale Trade & Purchasing	3910	Jewelry, Silverware, And Plated Ware
7	Wholesale Trade & Purchasing	4480	Water Transportation Of Passengers
7	Wholesale Trade & Purchasing	4810	Telephone Communication
7	Wholesale Trade & Purchasing	5010	Motor Vehicles And Motor Vehicle Parts, And Supplies
7	Wholesale Trade & Purchasing	5020	Furniture And Homefurnishings
7	Wholesale Trade & Purchasing	5030	Lumber And Other Construction Materials
7	Wholesale Trade & Purchasing	5040	Professional And Commercial Equipment And Supplies
7	Wholesale Trade & Purchasing	5050	Metals And Minerals, Except Petroleum
7	Wholesale Trade & Purchasing	5060	Electrical Goods
7	Wholesale Trade & Purchasing	5070	Hardware, Plumbing And Heating Equipment And Supplies
7	Wholesale Trade & Purchasing	5080	Machinery, Equipment, And Supplies
7	Wholesale Trade & Purchasing	5090	Miscellaneous Durable Goods
7	Wholesale Trade & Purchasing	5110	Paper And Paper Products
7	Wholesale Trade & Purchasing	5120	Drugs, Proprietaries, And Sundries
7	Wholesale Trade & Purchasing	5130	Apparel, Piece Goods, And Notions
7	Wholesale Trade & Purchasing	5140	Groceries And Related Products
7	Wholesale Trade & Purchasing	5160	Chemicals And Allied Products
7	Wholesale Trade & Purchasing	5170	Petroleum And Petroleum Products
7	Wholesale Trade & Purchasing	5180	Beer, Wine, And Distilled Beverages
7	Wholesale Trade & Purchasing	5190	Miscellaneous Nondurable Goods

7	Wholesale Trade & Purchasing	5590	Automotive Dealers, Not Elsewhere Classified
7	Wholesale Trade & Purchasing	5960	Nonstore Retailers
7	Wholesale Trade & Purchasing	6210	Security Brokers, Dealers, And Flotation Companies
7	Wholesale Trade & Purchasing	6220	Commodity Contracts Brokers And Dealers
7	Wholesale Trade & Purchasing	6410	Insurance Agents, Brokers, And Service
7	Wholesale Trade & Purchasing	7350	Miscellaneous Equipment Rental And Leasing
7	Wholesale Trade & Purchasing	7510	Automotive Rentals And Leasing, Without Drivers
7	Wholesale Trade & Purchasing	7820	Motion Picture Distribution And Allied Services
7	Wholesale Trade & Purchasing	8690	Membership Organizations, Not Elsewhere Classified
8	Mining & Extractive Services	1420	Crushed And Broken Stone
8	Mining & Extractive Services	1440	Sand And Gravel
8	Mining & Extractive Services	1450	Clay, Ceramic, & Refractory Minerals
8	Mining & Extractive Services	1530	Operative Builders
8	Mining & Extractive Services	3230	Glass Products, Made Of Purchased Glass
8	Mining & Extractive Services	4940	Water Supply
8	Mining & Extractive Services	4950	Sanitary Services
8	Mining & Extractive Services	6550	Land Subdividers And Developers
9	Food Manufacturing	2010	Meat Products
9	Food Manufacturing	2030	Canned, Frozen, And Preserved Fruits And Vegetables
9	Food Manufacturing	2050	Bakery Products
9	Food Manufacturing	2090	Miscellaneous Food Preparations And Kindred Products
9	Food Manufacturing	5420	Meat And Fish (Seafood) Markets, Including Freezer
10	High Technology	2070	Fats And Oils
10	High Technology	2080	Beverages
10	High Technology	2820	Plastics Materials And Synthetic Resins
10	High Technology	2830	Drugs
10	High Technology	2850	Paints, Varnishes, Lacquers, Enamels, And Allied Products
10	High Technology	2860	Industrial Organic Chemicals
10	High Technology	3480	Ordnance And Accessories, Except Vehicles And Guided Missiles
10	High Technology	3660	Communications Equipment
10	High Technology	3720	Aircraft And Parts
10	High Technology	3810	Search, Detection, Navigation, And Aeronautical
10	High Technology	4740	Rental Of Railroad Cars
10	High Technology	8710	Engineering, Architectural, And Surveying Services
10	High Technology	8730	Research, Development, And Testing Services
10	High Technology	8740	Management And Public Relations Services
11	Apparel Manufacturing	2240	Narrow Fabric And Other Smallwares Mills
11	Apparel Manufacturing	2320	Men's And Boys' Furnishings, And Work Clothing
11	Apparel Manufacturing	2330	Women's, Misses', and Juniors' Outerwear
11	Apparel Manufacturing	2360	Girls', Children's, And Infants' Outerwear
11	Apparel Manufacturing	2380	Miscellaneous Apparel And Accessories
11	Apparel Manufacturing	2390	Miscellaneous Fabricated Textile Products
11	Apparel Manufacturing	3130	Boot And Shoe Cut Stock And Findings
11	Apparel Manufacturing	3140	Footwear, Except Rubber
11	Apparel Manufacturing	3160	Luggage
11	Apparel Manufacturing	3190	Leather Goods, Not Elsewhere Classified
11	Apparel Manufacturing	7210	Laundry, Cleaning, And Garment Services
11	Apparel Manufacturing	7250	Shoe Repair Shops And Shoeshine Parlors
11	Apparel Manufacturing	7640	Reupholstery And Furniture Repair
12	Print, Textiles & Wood Manufacturing	2260	Dyeing and Finishing Textiles, Except Wool Fabrics And Knit Goods
12	Print, Textiles & Wood Manufacturing	2270	Carpets And Rugs
12	Print, Textiles & Wood Manufacturing	2290	Miscellaneous Textile Goods

12	Print, Textiles & Wood Manufacturing	2340	Women's, Misses', Children's, And Infants' Undergarments
12	Print, Textiles & Wood Manufacturing	2350	Hats, Caps, And Millinery
12	Print, Textiles & Wood Manufacturing	2420	Sawmills And Planing Mills
12	Print, Textiles & Wood Manufacturing	2430	Millwork, Veneer, Plywood, And Structural Wood Members
12	Print, Textiles & Wood Manufacturing	2440	Wood Containers
12	Print, Textiles & Wood Manufacturing	2490	Miscellaneous Wood Products
12	Print, Textiles & Wood Manufacturing	2510	Household Furniture
12	Print, Textiles & Wood Manufacturing	2730	Books
12	Print, Textiles & Wood Manufacturing	2750	Commercial Printing
12	Print, Textiles & Wood Manufacturing	2760	Manifold Business Forms
12	Print, Textiles & Wood Manufacturing	2770	Greeting Cards
12	Print, Textiles & Wood Manufacturing	2780	Blankbooks, Looseleaf Binders, And Bookbinding And Related Work
12	Print, Textiles & Wood Manufacturing	2790	Services Industries For The Printing Trade
12	Print, Textiles & Wood Manufacturing	3150	Leather Gloves And Mittens
12	Print, Textiles & Wood Manufacturing	3930	Musical Instruments
13	Business & Organization Services	2310	Men's And Boys' Suits, Coats, And Overcoats
13	Business & Organization Services	3650	Household Audio And Video Equipment, And Audio Recordings
13	Business & Organization Services	4220	Public Warehousing And Storage
13	Business & Organization Services	4230	Terminal And Joint Terminal Maintenance Facilities
13	Business & Organization Services	4730	Arrangement Of Transportation Of Freight And Cargo
13	Business & Organization Services	6230	Security And Commodity Exchanges
13	Business & Organization Services	6350	Surety Insurance
13	Business & Organization Services	6710	Holding Offices
13	Business & Organization Services	6720	Investment Offices
13	Business & Organization Services	6730	Trusts
13	Business & Organization Services	6790	Miscellaneous Investing
13	Business & Organization Services	8390	Social Services, Not Elsewhere Classified
13	Business & Organization Services	8610	Business Associations
13	Business & Organization Services	8620	Professional Membership Organizations
13	Business & Organization Services	8650	Political Organizations
13	Business & Organization Services	9010	Federal Government Except Education And Hospitals
14	Assembled & Fabricated Products	2520	Office Furniture
14	Assembled & Fabricated Products	2540	Partitions, Shelving, Lockers, And Office And Store Fixtures
14	Assembled & Fabricated Products	2590	Miscellaneous Furniture And Fixtures
14	Assembled & Fabricated Products	3050	Gaskets, Rubber And Plastics Hoses
14	Assembled & Fabricated Products	3060	Fabricated Rubber Products, Not Elsewhere Classified
14	Assembled & Fabricated Products	3080	Miscellaneous Plastics Products
14	Assembled & Fabricated Products	3430	Heating Equipment, Except Electric And Plumbing
14	Assembled & Fabricated Products	3440	Fabricated Structural Metal Products
14	Assembled & Fabricated Products	3490	Miscellaneous Fabricated Metal Products
14	Assembled & Fabricated Products	3510	Engines And Turbines
14	Assembled & Fabricated Products	3520	Farm And Garden Machinery And Equipment
14	Assembled & Fabricated Products	3530	Construction, Mining, And Materials Handling Machinery And Equipment
14	Assembled & Fabricated Products	3550	Special Industry Machinery, Except Metalworking Machinery
14	Assembled & Fabricated Products	3560	General Industrial Machinery And Equipment
14	Assembled & Fabricated Products	3570	Computer And Office Equipment
14	Assembled & Fabricated Products	3580	Refrigeration And Service Industry Machinery
14	Assembled & Fabricated Products	3610	Electric Transmission And Distribution Equipment
14	Assembled & Fabricated Products	3620	Electrical Industrial Apparatus
14	Assembled & Fabricated Products	3630	Household Appliances
14	Assembled & Fabricated Products	3640	Electric Lighting And Wiring Equipment
14	Assembled & Fabricated Products	3670	Electronic Components And Accessories

14	Assembled & Fabricated Products	3690	Miscellaneous Electrical Machinery,Equipment And Supplies
14	Assembled & Fabricated Products	3710	Motor Vehicles And Motor Vehicle Equipment
14	Assembled & Fabricated Products	3730	Ship And Boat Building And Repairing
14	Assembled & Fabricated Products	3760	Guided Missiles And Space Vehicles And Parts
14	Assembled & Fabricated Products	3790	Miscellaneous Transportation Equipment
14	Assembled & Fabricated Products	3820	Laboratory Apparatus And Analytical
14	Assembled & Fabricated Products	3840	Surgical, Medical, And Dental Instruments And Supplies
14	Assembled & Fabricated Products	3850	Ophthalmic Goods
14	Assembled & Fabricated Products	3940	Dolls, Toys, Games And Sporting And Athletic Goods
14	Assembled & Fabricated Products	3960	Costume Jewelry, Novelties, And Buttons
14	Assembled & Fabricated Products	3990	Miscellaneous Manufacturing Industries
15	Metal & Plastic Manufacturing	2530	Public Building And Related Furniture
15	Metal & Plastic Manufacturing	3170	Handbags And Other Personal Leather Goods
15	Metal & Plastic Manufacturing	3310	Steel Works, Blast Furnaces, And Rolling And Finishing Mills
15	Metal & Plastic Manufacturing	3320	Iron And Steel Foundries
15	Metal & Plastic Manufacturing	3330	Primary Smelting And Refining Of Nonferrous Metals
15	Metal & Plastic Manufacturing	3340	Secondary Smelting And Refining Of Nonferrous Metals
15	Metal & Plastic Manufacturing	3350	Rolling, Drawing, And Extruding Of Nonferrous Metals
15	Metal & Plastic Manufacturing	3360	Nonferrous Foundries (castings)
15	Metal & Plastic Manufacturing	3390	Miscellaneous Primary Metal Products
15	Metal & Plastic Manufacturing	3420	Cutlery, Handtools, And General Hardware
15	Metal & Plastic Manufacturing	3450	Screw Machine Products
15	Metal & Plastic Manufacturing	3460	Metal Forgings And Stampings
15	Metal & Plastic Manufacturing	3470	Coating, Engraving, And Allied Services
15	Metal & Plastic Manufacturing	3540	Metalworking Machinery And Equipment
15	Metal & Plastic Manufacturing	3590	Miscellaneous Industrial And Commercial Machinery And Equipment
15	Metal & Plastic Manufacturing	3740	Railroad Equipment
16	Arts & Media	2710	Newspapers: Publishing, Or Publishing And Printing
16	Arts & Media	4830	Radio And Television Broadcasting Stations
16	Arts & Media	7220	Photographic Studios, Portrait
16	Arts & Media	7310	Advertising
16	Arts & Media	7330	Mailing, Reproduction, Commercial Art And Photography
16	Arts & Media	7810	Motion Picture Production And Allied Services
16	Arts & Media	7910	Dance Studios, Schools, And Halls
16	Arts & Media	7920	Theatrical Producers (Except Motion Pictures)
16	Arts & Media	8990	Services, Not Elsewhere Classified
17	Speciality Retail Trade	2720	Periodicals: Publishing, Or Publishing And Printing
17	Speciality Retail Trade	4720	Arrangement Of Passenger Transportation
17	Speciality Retail Trade	5210	Lumber And Other Building Materials Dealers
17	Speciality Retail Trade	5310	Department Stores
17	Speciality Retail Trade	5410	Grocery Stores
17	Speciality Retail Trade	5710	Furniture And Homefurnishings Stores
17	Speciality Retail Trade	5910	Drug Stores And Proprietary Stores
17	Speciality Retail Trade	5990	Retail Stores, Not Elsewhere Classified
18	Utilities & Repair Services	2870	Agricultural Chemicals
18	Utilities & Repair Services	3240	Cement, Hydraulic
18	Utilities & Repair Services	4610	Pipelines, Except Natural Gas
18	Utilities & Repair Services	4840	Cable And Other Pay Television Services
18	Utilities & Repair Services	4910	Electric Services
18	Utilities & Repair Services	4920	Gas Production And Distribution
18	Utilities & Repair Services	4930	Combination Electric And Gas, And Other Utility Services
18	Utilities & Repair Services	4960	Steam And Air-Conditioning Supply

18	Utilities & Repair Services	7530	Automotive Repair Shops
18	Utilities & Repair Services	7620	Electrical Repair Shops
18	Utilities & Repair Services	7690	Miscellaneous Repair Shops And Related Services
19	Transportation	3270	Concrete, Gypsum, And Plaster Products
19	Transportation	4010	Railroads
19	Transportation	4110	Local And Suburban Passenger Transportation
19	Transportation	4120	Taxicabs
19	Transportation	4130	Intercity And Rural Bus Transportation
19	Transportation	4140	Bus Charter Service
19	Transportation	4150	School Buses
19	Transportation	4210	Trucking And Courier Services, Except Air
19	Transportation	4490	Services Incidental To Water Transportation
19	Transportation	4510	Air Transportation, Scheduled, And Air Courier Services
19	Transportation	4520	Air Transportation, Nonscheduled
19	Transportation	4780	Miscellaneous Services Incidental To Transportation
19	Transportation	5980	Fuel Dealers
19	Transportation	7520	Automobile Parking
19	Transportation	7540	Automotive Services, Except Repair
20	General Retail Trade	4410	Deep Sea Foreign Transportation Of Freight
20	General Retail Trade	5230	Paint, Glass, And Wallpaper Stores
20	General Retail Trade	5250	Hardware Stores
20	General Retail Trade	5330	Variety Stores
20	General Retail Trade	5390	Miscellaneous General Merchandise Stores
20	General Retail Trade	5430	Fruit And Vegetable Markets
20	General Retail Trade	5440	Candy, Nut, And Confectionery Stores
20	General Retail Trade	5490	Miscellaneous Food Stores
20	General Retail Trade	5540	Gasoline Service Stations
20	General Retail Trade	5610	Men's & Boys' Clothing Stores
20	General Retail Trade	5620	Women's Clothing Stores
20	General Retail Trade	5630	Women's Accessory & Specialty Stores
20	General Retail Trade	5640	Children's And Infants' Wear Stores
20	General Retail Trade	5650	Family Clothing Stores
20	General Retail Trade	5660	Shoe Stores
20	General Retail Trade	5690	Misc. Apparel & Accessory Stores
20	General Retail Trade	5730	Radio, Television, Consumer Electronics, And Music Stores
20	General Retail Trade	5920	Liquor Stores
20	General Retail Trade	5930	Used Merchandise Stores
20	General Retail Trade	5940	Miscellaneous Shopping Goods Stores
20	General Retail Trade	7840	Video Tape Rental
21	Entertainment & Food	4440	Water Transportation Of Freight, Not Elsewhere Classified
21	Entertainment & Food	5450	Dairy Products Stores
21	Entertainment & Food	5460	Retail Bakeries
21	Entertainment & Food	5810	Eating And Drinking Places
21	Entertainment & Food	7830	Motion Picture Theaters
21	Entertainment & Food	7930	Bowling Centers
21	Entertainment & Food	7990	Miscellaneous Amusement And Recreation Services
22	Information Technology	4820	Telegraph And Other Message Communications
22	Information Technology	7370	Computer Programming, Data Processing, And Computer Services
23	Finance & Insurance	4890	Communications Services, Not Elsewhere Classified
23	Finance & Insurance	6010	Central Reserve Depository Institutions
23	Finance & Insurance	6110	Federal And Federally-Sponsored Credit Agencies
23	Finance & Insurance	6140	Personal Credit Institutions

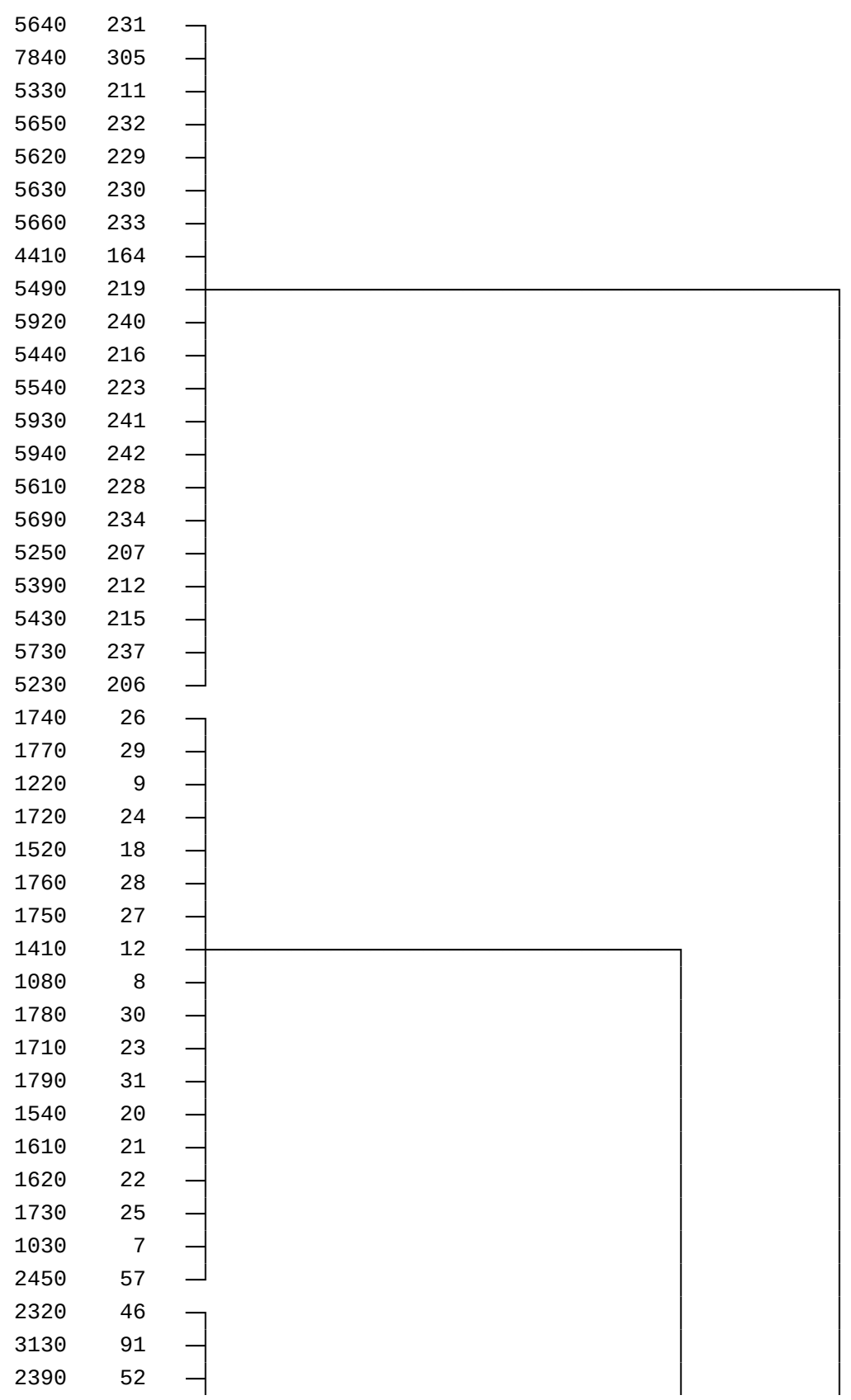
23	Finance & Insurance	6160	Mortgage Bankers And Brokers
23	Finance & Insurance	6280	Services Allied With The Exchange Of Securities Or Commodities
23	Finance & Insurance	6310	Life Insurance
23	Finance & Insurance	6320	Medical Service And Health Insurance And Medical Service Plans
23	Finance & Insurance	6330	Fire, Marine, And Casualty Insurance
23	Finance & Insurance	6370	Pension, Health, And Welfare Funds
23	Finance & Insurance	7290	Miscellaneous Personal Services
23	Finance & Insurance	8630	Labor Unions And Similar Labor Organizations
23	Finance & Insurance	8720	Accounting, Auditing, And Bookkeeping Services
24	Motor Vehicle Sales & Services	5260	Retail Nurseries, Lawn And Garden Supply Stores
24	Motor Vehicle Sales & Services	5270	Mobile Home Dealers
24	Motor Vehicle Sales & Services	5510	Motor Vehicle Dealers (New And Used)
24	Motor Vehicle Sales & Services	5520	Motor Vehicle Dealers (Used Only)
24	Motor Vehicle Sales & Services	5530	Auto And Home Supply Stores
24	Motor Vehicle Sales & Services	5550	Boat Dealers
24	Motor Vehicle Sales & Services	5560	Recreational Vehicle Dealers
24	Motor Vehicle Sales & Services	5570	Motorcycle Dealers
24	Motor Vehicle Sales & Services	5720	Household Appliance Stores
25	Banking	6020	Commercial Banks
25	Banking	6030	Savings Institutions
25	Banking	6060	Credit Unions
25	Banking	6090	Functions Related To Depository Banking
25	Banking	6150	Business Credit Institutions
25	Banking	6390	Insurance Carriers, Not Elsewhere Classified
25	Banking	7320	Consumer Credit Reporting Agencies
26	Legal	6360	Title Insurance
26	Legal	6540	Title Abstract Offices
26	Legal	8110	Legal Services
27	Personal Grooming Services	7230	Beauty Shops
27	Personal Grooming Services	7240	Barber Shops
28	Education	8210	Elementary And Secondary Schools
28	Education	8220	Colleges, Universities, Professional Schools, And Junior Colleges
28	Education	8230	Libraries
28	Education	8240	Vocational Schools
28	Education	8290	Schools And Educational Services, Not Elsewhere Classified
28	Education	8350	Child Day Care Services

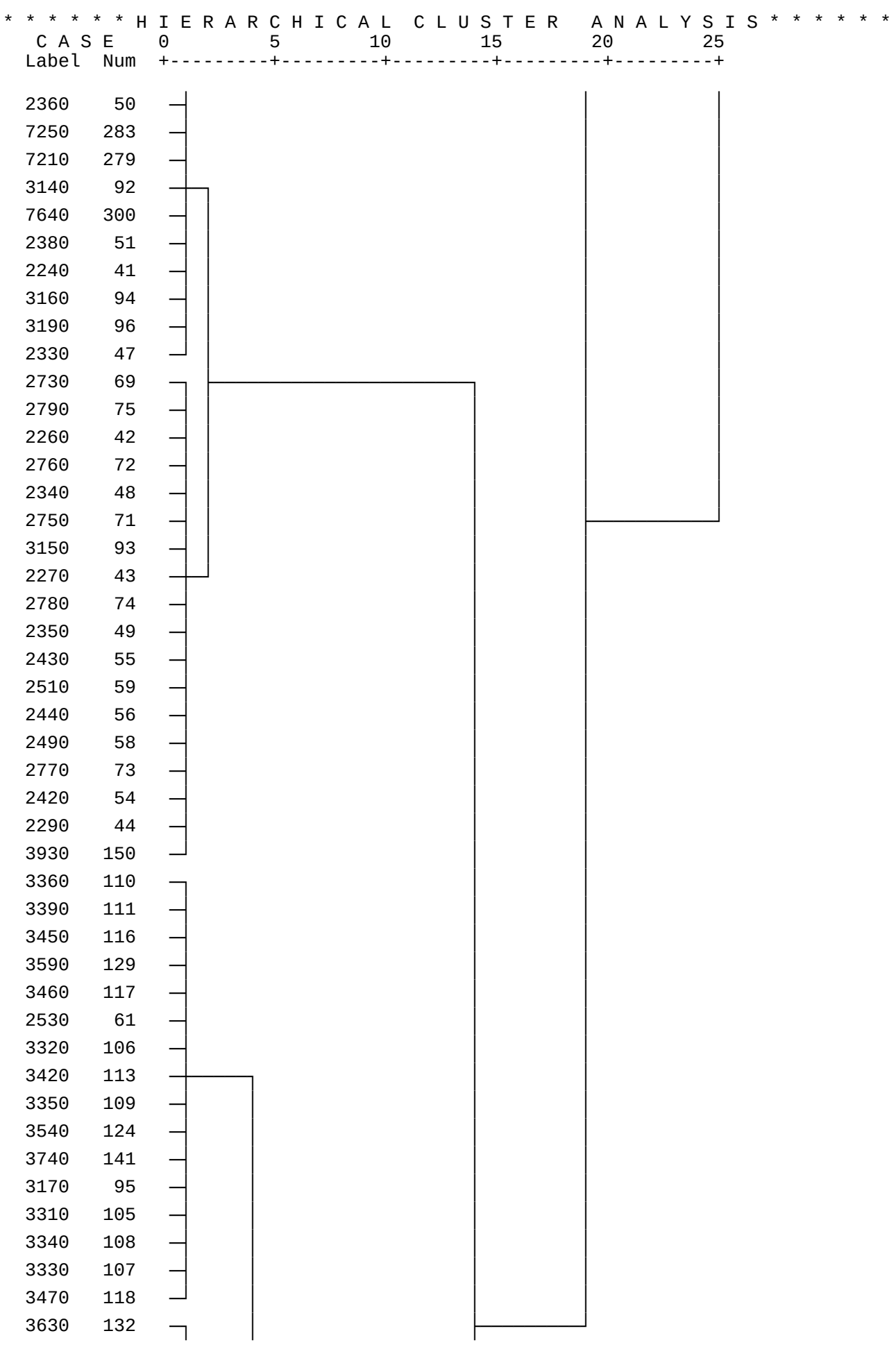
Appendix B - Dendogram

* * * * * * H I E R A R C H I C A L C L U S T E R A N A L Y S I S * * * * * *

Dendrogram using Ward Method

Rescaled Distance Cluster Combine

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2790 75
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2270 43
2780 74
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2430 55
2510 59
2440 56
2490 58
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2290 44
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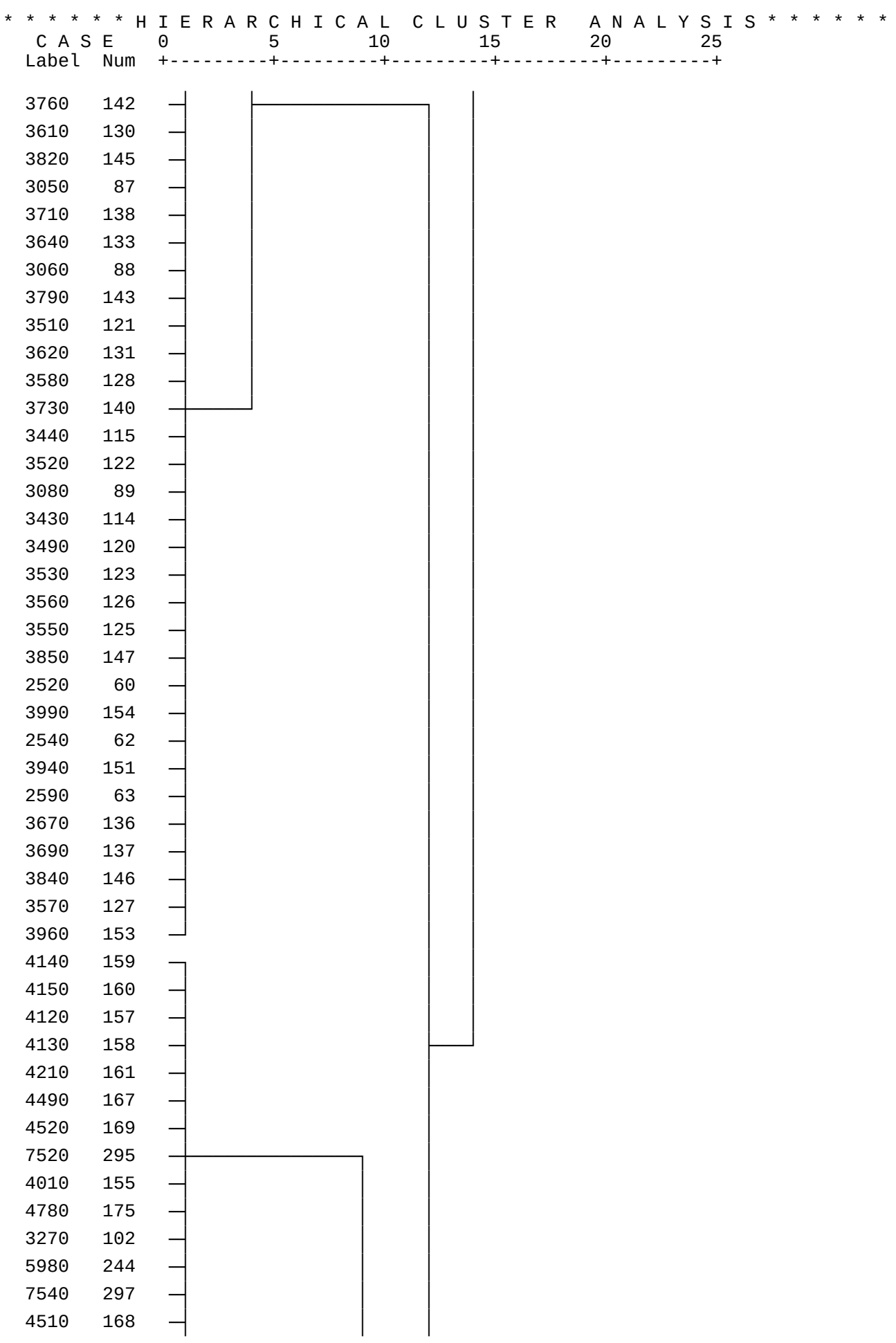
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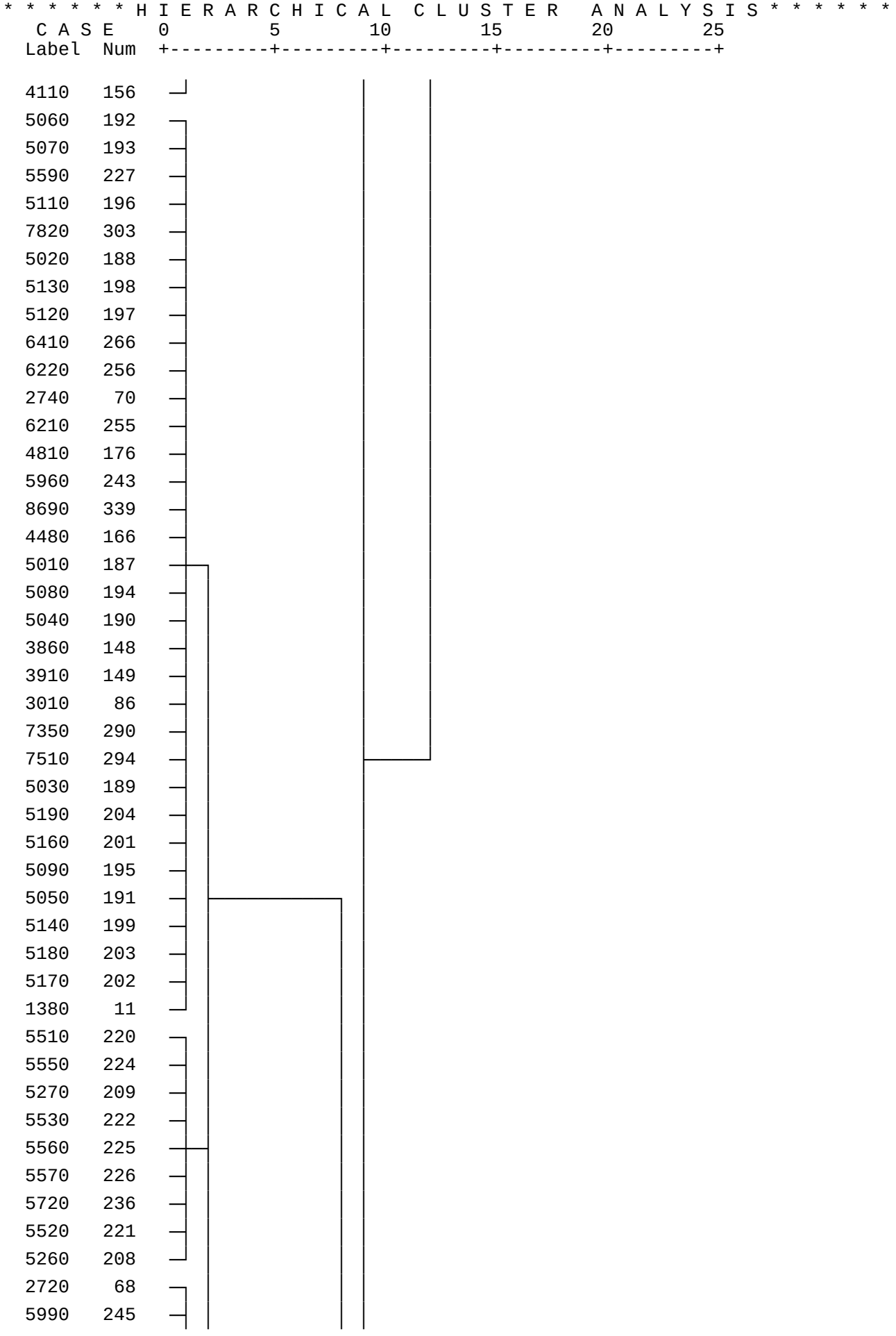
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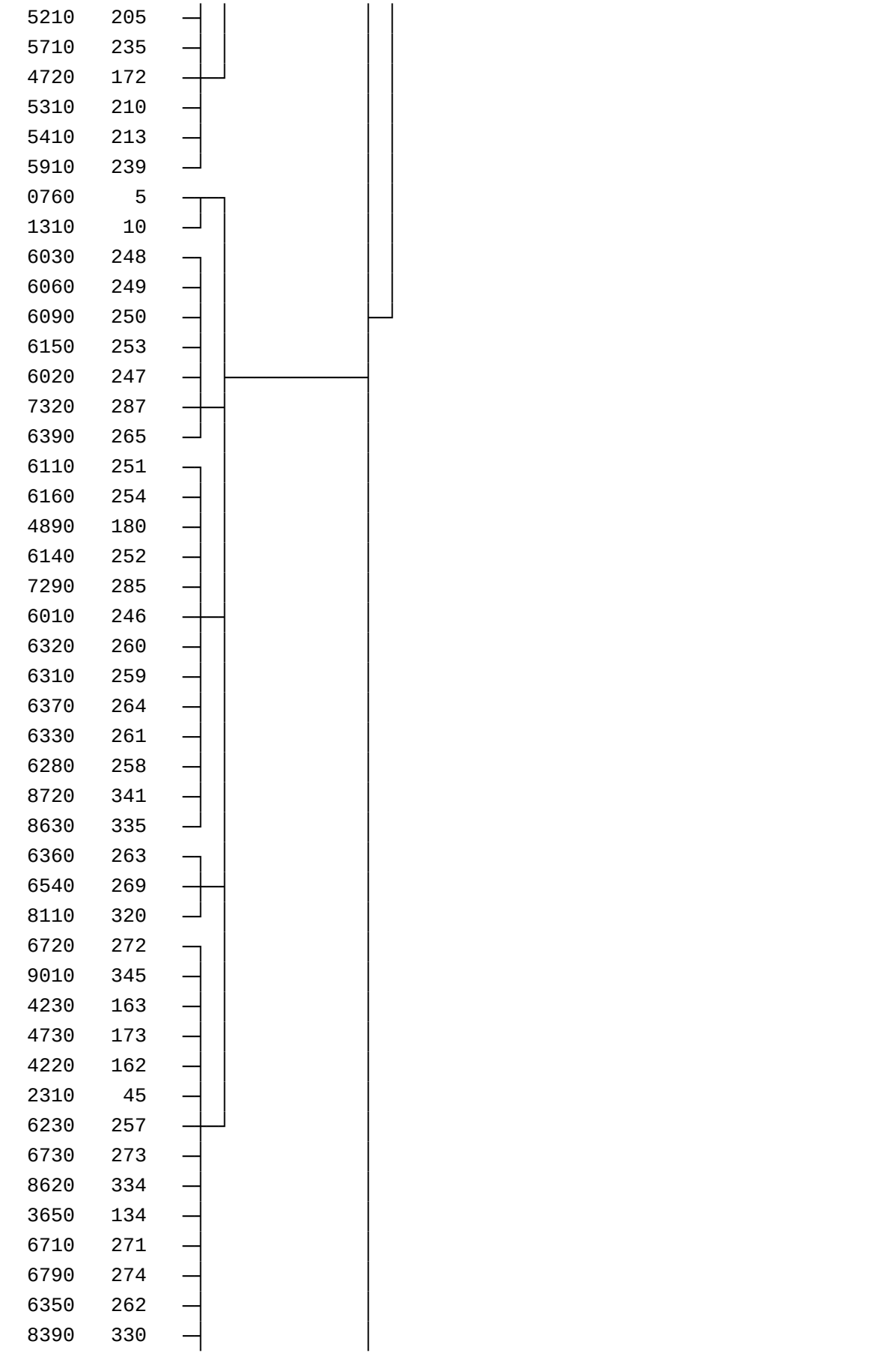
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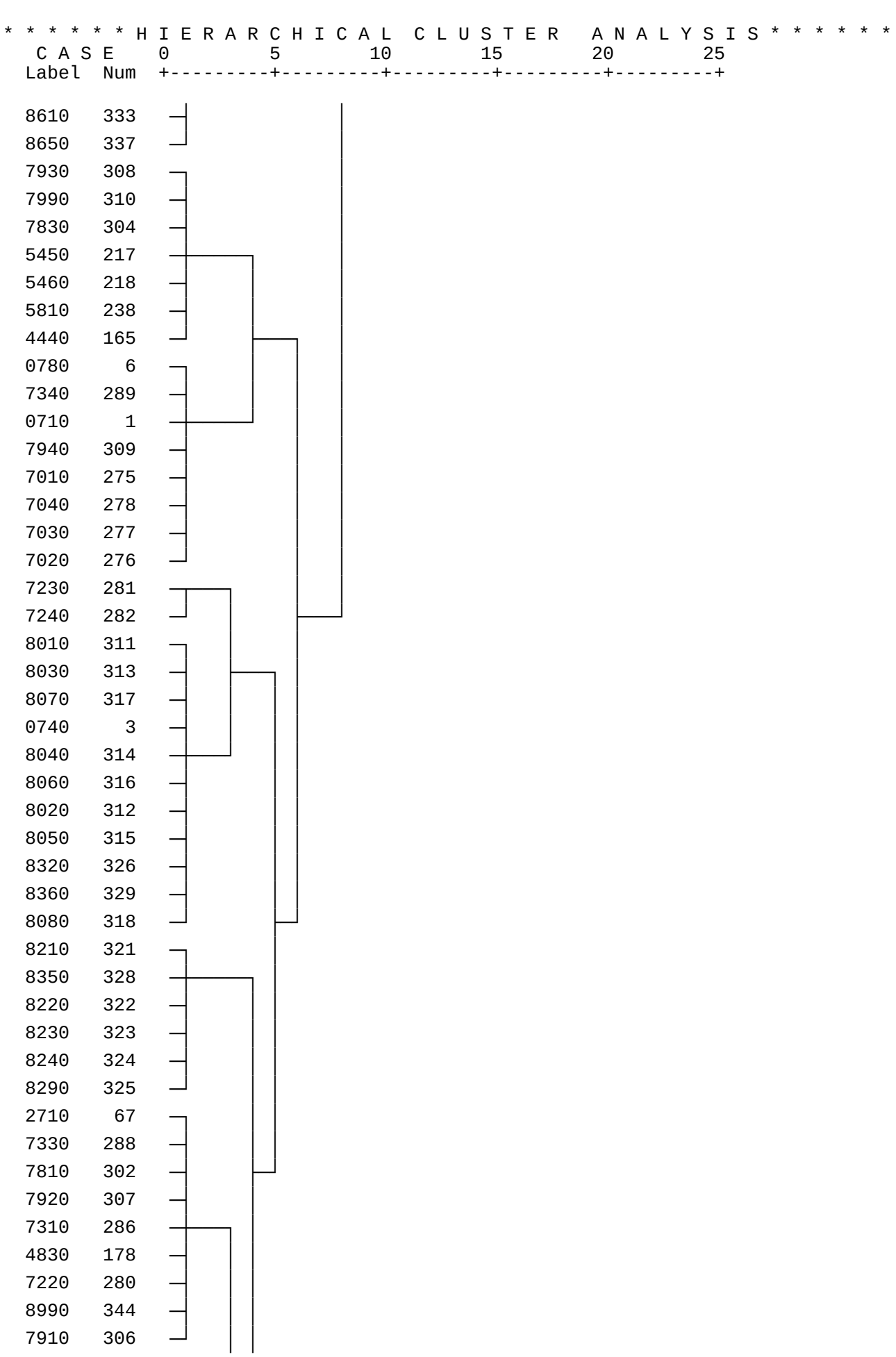
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7010 275
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8010 311
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8350 328
8220 322
8230 323
8240 324
8290 325
2710 67
7330 288
7810 302
7920 307
7310 286
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8990 344
7910 306

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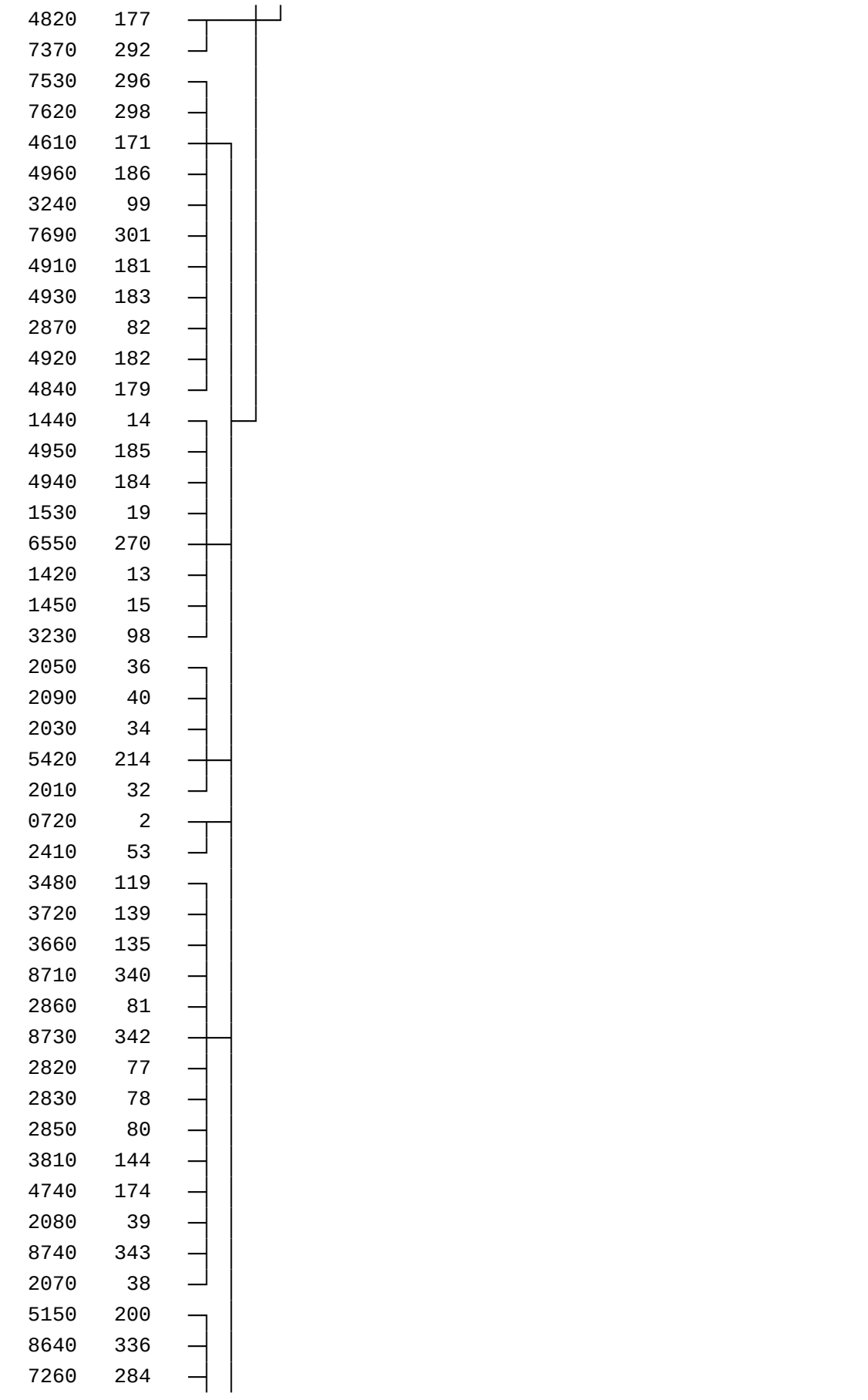

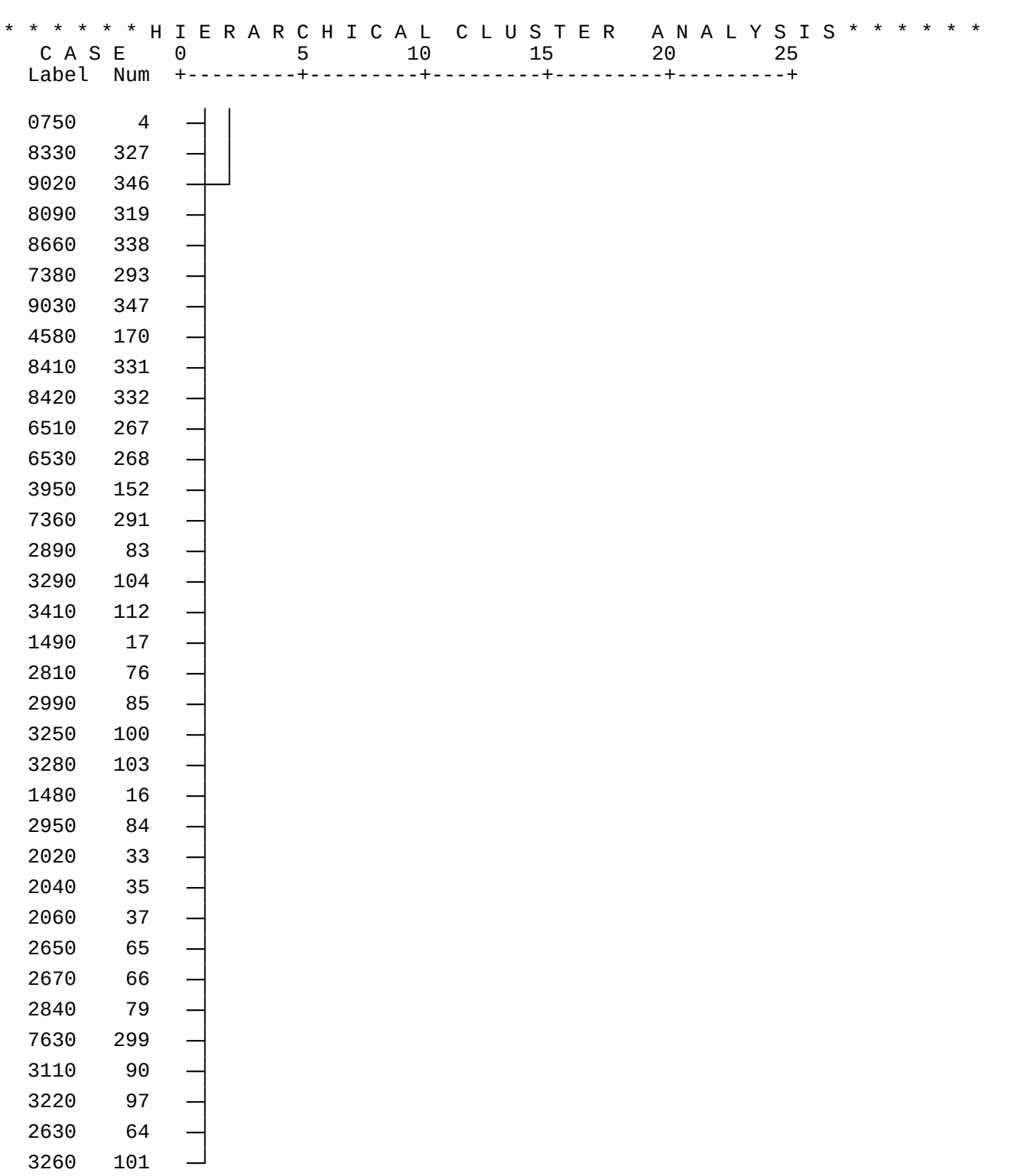
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8090 319
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7380 293
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8420 332
6510 267
6530 268
3950 152
7360 291
2890 83
3290 104
3410 112
1490 17
2810 76
2990 85
3250 100
3280 103
1480 16
2950 84
2020 33
2040 35
2060 37
2650 65
2670 66
2840 79
7630 299
3110 90
3220 97
2630 64
3260 101

P-0802-1
August 2002

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